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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 29, 1998

Route to:

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 29, 1998 Volume 1214 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1250.00
International fees	
Basic fee	455.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	105.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	105.00
— Confirmation fee	52.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	49.00	98.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	360.00	720.00
USPTO was ISA but not IPEA	395.00	790.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	535.00	1070.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	465.00	930.00
Other National fees		
— For each independent claim in excess of 3	41.00	82.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	135.00	270.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 10, 1997

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 26, 1995 for which maintenance fees due at 3 years

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and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,452,475 through 5,454,118
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 24, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,050,240 through 5,052,051
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 22, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,694,505 through 4,696,063
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $525.00
By other than a small entity $1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,050.00
By other than a small entity $2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,580.00
By other than a small entity $3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional $1,640.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED July 22, 1998
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,601,067	06/732,553	07/22/86
4,601,069	06/672,623	07/22/86
4,601,077	06/722,360	07/22/86
4,601,083	06/564,712	07/22/86
4,601,090	06/736,126	07/22/86
4,601,116	06/734,798	07/22/86
4,601,124	06/714,961	07/22/86
4,601,127	06/620,939	07/22/86
4,601,128	06/690,036	07/22/86
4,601,133	06/761,057	07/22/86
4,601,138	06/677,979	07/22/86
4,601,141	06/620,675	07/22/86
4,601,143	06/574,010	07/22/86
4,601,146	06/582,207	07/22/86
4,601,152	06/605,372	07/22/86
4,601,163	06/680,787	07/22/86
4,601,167	06/626,211	07/22/86
4,601,177	06/748,474	07/22/86
4,601,179	06/752,124	07/22/86
4,601,200	06/499,518	07/22/86
4,601,209	06/722,537	07/22/86
4,601,213	06/605,687	07/22/86
4,601,218	06/622,733	07/22/86
4,601,223	06/631,371	07/22/86
4,601,225	06/707,745	07/22/86
4,601,235	06/621,832	07/22/86
4,601,238	06/661,109	07/22/86
4,601,239	06/783,141	07/22/86
4,601,240	06/657,650	07/22/86
4,601,241	06/695,348	07/22/86
4,601,243	06/656,891	07/22/86
4,601,256	06/637,448	07/22/86
4,601,258	06/653,940	07/22/86
4,601,263	06/750,750	07/22/86
4,601,270	06/566,001	07/22/86
4,601,271	06/687,726	07/22/86
4,601,273	06/655,225	07/22/86
4,601,275	06/410,611	07/22/86
4,601,277	06/624,162	07/22/86
4,601,279	06/775,211	07/22/86
4,601,283	06/452,377	07/22/86
4,601,286	06/602,602	07/22/86
4,601,287	06/785,631	07/22/86
4,601,288	06/703,963	07/22/86
4,601,289	06/719,785	07/22/86
4,601,290	06/540,319	07/22/86
4,601,299	06/562,681	07/22/86
4,601,310	06/452,721	07/22/86
4,601,311	06/687,518	07/22/86
4,601,315	06/267,333	07/22/86
4,601,323	06/712,741	07/22/86
4,601,326	06/736,285	07/22/86
4,601,328	06/650,526	07/22/86
4,601,329	06/528,065	07/22/86
4,601,331	06/768,541	07/22/86
4,601,334	06/597,852	07/22/86
4,601,336	06/651,388	07/22/86
4,601,337	06/609,062	07/22/86
4,601,340	06/525,911	07/22/86
4,601,346	06/650,616	07/22/86
4,601,353	06/658,244	07/22/86

Patent Number	Serial Number	Issue Date
4,601,355	06/646,089	07/22/86
4,601,359	06/743,215	07/22/86
4,601,365	06/742,972	07/22/86
4,601,375	06/511,283	07/22/86
4,601,387	06/649,900	07/22/86
4,601,388	06/695,375	07/22/86
4,601,394	06/607,872	07/22/86
4,601,396	06/674,792	07/22/86
4,601,406	06/747,981	07/22/86
4,601,417	06/712,529	07/22/86
4,601,424	06/735,040	07/22/86
4,601,439	06/741,165	07/22/86
4,601,441	06/608,358	07/22/86
4,601,442	06/545,083	07/22/86
4,601,448	06/632,656	07/22/86
4,601,449	06/543,598	07/22/86
4,601,452	06/659,578	07/22/86
4,601,454	06/642,246	07/22/86
4,601,463	06/627,468	07/22/86
4,601,473	06/656,141	07/22/86
4,601,479	06/681,135	07/22/86
4,601,482	06/709,135	07/22/86
4,601,483	06/640,955	07/22/86
4,601,489	06/759,482	07/22/86
4,601,490	06/541,784	07/22/86
4,601,492	06/435,458	07/22/86
4,601,493	06/600,070	07/22/86
4,601,500	06/702,559	07/22/86
4,601,509	06/697,268	07/22/86
4,601,517	06/649,191	07/22/86
4,601,525	06/735,505	07/22/86
4,601,526	06/771,141	07/22/86
4,601,532	06/492,690	07/22/86
4,601,534	06/508,499	07/22/86
4,601,535	06/715,257	07/22/86
4,601,536	06/475,561	07/22/86
4,601,548	06/546,517	07/22/86
4,601,555	06/642,174	07/22/86
4,601,568	06/664,294	07/22/86
4,601,575	06/353,505	07/22/86
4,601,577	06/534,119	07/22/86
4,601,587	06/534,352	07/22/86
4,601,590	06/766,740	07/22/86
4,601,597	06/608,860	07/22/86
4,601,610	06/698,197	07/22/86
4,601,613	06/602,078	07/22/86
4,601,616	06/711,303	07/22/86
4,601,617	06/721,566	07/22/86
4,601,621	06/609,417	07/22/86
4,601,627	06/585,695	07/22/86
4,601,648	06/773,549	07/22/86
4,601,651	06/720,303	07/22/86
4,601,653	06/772,337	07/22/86
4,601,656	06/600,110	07/22/86
4,601,660	06/746,052	07/22/86
4,601,666	06/700,337	07/22/86
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4,601,685	06/746,389	07/22/86
4,601,686	06/343,442	07/22/86
4,601,704	06/546,139	07/22/86
4,601,721	06/651,006	07/22/86
4,601,724	06/614,633	07/22/86
4,601,728	06/732,757	07/22/86
4,601,729	06/656,675	07/22/86
4,601,732	06/675,466	07/22/86
4,601,736	06/668,846	07/22/86
4,601,737	06/682,325	07/22/86
4,601,739	06/645,658	07/22/86
4,601,750	06/750,337	07/22/86
4,601,759	06/598,643	07/22/86
4,601,770	06/533,651	07/22/86
4,601,782	06/747,156	07/22/86
4,601,786	06/597,396	07/22/86
4,601,790	06/514,905	07/22/86
4,601,791	06/755,302	07/22/86
4,601,801	06/753,223	07/22/86
4,601,807	06/692,143	07/22/86
4,601,808	06/731,067	07/22/86
4,601,812	06/689,108	07/22/86
4,601,813	06/412,321	07/22/86
4,601,828	06/688,861	07/22/86
4,601,829	06/685,792	07/22/86
4,601,837	06/773,173	07/22/86
4,601,839	06/320,991	07/22/86
4,601,843	06/719,392	07/22/86
4,601,844	06/779,310	07/22/86
4,601,853	06/697,995	07/22/86
4,601,858	06/744,348	07/22/86
4,601,864	06/610,493	07/22/86
4,601,872	06/600,905	07/22/86
4,601,874	06/752,512	07/22/86
4,601,879	06/737,976	07/22/86
4,601,883	06/741,209	07/22/86
4,601,884	06/624,703	07/22/86
4,601,886	06/613,565	07/22/86
4,601,889	06/546,987	07/22/86
4,601,897	06/795,689	07/22/86
4,601,898	06/716,491	07/22/86
4,601,899	06/716,552	07/22/86
4,601,901	06/528,810	07/22/86
4,601,906	06/659,527	07/22/86
4,601,907	06/730,225	07/22/86
4,601,918	06/769,902	07/22/86
4,601,921	06/686,081	07/22/86
4,601,951	06/557,942	07/22/86
4,601,957	06/770,777	07/22/86
4,601,967	06/679,054	07/22/86
4,601,970	06/756,698	07/22/86
4,601,977	06/502,473	07/22/86
4,601,982	06/367,334	07/22/86
4,601,987	06/706,039	07/22/86
4,601,992	06/637,695	07/22/86
4,601,996	06/671,139	07/22/86
4,602,007	06/651,136	07/22/86
4,602,009	06/645,100	07/22/86
4,602,021	06/745,456	07/22/86
4,602,022	06/673,722	07/22/86
4,602,025	06/621,583	07/22/86
4,602,032	06/683,378	07/22/86
4,602,034	06/669,037	07/22/86
4,602,037	06/494,393	07/22/86
4,602,038	06/618,596	07/22/86
4,602,048	06/799,942	07/22/86
4,602,050	06/720,596	07/22/86
4,602,054	06/713,168	07/22/86
4,602,059	06/605,026	07/22/86
4,602,064	06/676,683	07/22/86
4,602,070	06/751,159	07/22/86
4,602,074	06/682,782	07/22/86
4,602,084	06/512,089	07/22/86
4,602,087	06/611,819	07/22/86
4,602,091	06/573,773	07/22/86
4,602,095	06/566,633	07/22/86
4,602,098	06/736,905	07/22/86
4,602,100	06/661,355	07/22/86
4,602,103	06/721,627	07/22/86
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4,602,144	06/651,769	07/22/86
4,602,146	06/597,963	07/22/86
4,602,149	06/517,380	07/22/86
4,602,152	06/497,637	07/22/86
4,602,159	06/606,775	07/22/86
4,602,164	06/696,834	07/22/86
4,602,165	06/704,959	07/22/86
4,602,166	06/495,971	07/22/86
4,602,170	06/530,450	07/22/86
4,602,179	06/677,769	07/22/86
4,602,180	06/689,217	07/22/86

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4,602,183	06/509,755	07/22/86
4,602,208	06/717,740	07/22/86
4,602,216	06/548,692	07/22/86
4,602,222	06/724,977	07/22/86
4,602,229	06/567,436	07/22/86
4,602,230	06/684,289	07/22/86
4,602,231	06/632,813	07/22/86
4,602,232	06/732,695	07/22/86
4,602,238	06/572,362	07/22/86
4,602,241	06/749,858	07/22/86
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5,330,094	08/167,162	07/19/94
5,330,097	07/966,170	07/19/94
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5,330,147	08/007,529	07/19/94
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5,330,331	07/970,258	07/19/94
5,330,337	07/967,345	07/19/94
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5,330,367	08/025,967	07/19/94
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5,330,402	08/059,859	07/19/94
5,330,417	07/768,272	07/19/94
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5,331,364	07/918,201	07/19/94
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5,331,391	07/897,991	07/19/94
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5,331,605	08/121,010	07/19/94
5,331,619	07/838,062	07/19/94
5,331,650	07/849,954	07/19/94
5,331,653	07/975,947	07/19/94
5,331,670	07/830,036	07/19/94
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Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 07/24/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,534,923	06/548,453	11/03/83	08/13/85	07/24/98
4,752,170	06/903,636	09/04/86	06/21/88	07/28/98
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5,281,107	07/944,675	09/15/92	01/25/94	07/24/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,016,038, Re. S.N. 08/427,703, Apr. 24, 1995, Cl. 354/418, STROBE CONTROL APPARATUS, Takeo Kobayashi, et. al., Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Bruce H. Bernstein, Ex. Gp.: 2101

5,147,341, Re. S.N. 09/110,429, Jul. 2, 1998, Cl. 604/349, SELF CONTAINED URINARY CATHETER ASSEMBLY, Richard N. Starke, et. al., Owner of Record: *Medical Marketing Group, Decatur, Ga.,* Attorney or Agent: B. J. Powell, Ex. Gp.: 3308

5,249,521, Re. S.N. 08/999,773, Mar. 25, 1997, Cl. 101/230, DEVICE FOR CHANGING OVER TO SINGLE-SIDED PRINTING OR PERFECTING ON SHEET-FED ROTARY PRINTING MACHINES, Ingo Kobler, Owner of Record: *Man Roland Druckmaschinen AG, Offenbach Am-Main, Germany,* Attorney or Agent: Joseph R. Keating, Ex. Gp.: 2854

5,332,305, Re. S.N. 08/731,115, Oct. 9, 1996, Cl. 312/328, TOOL CHEST WITH TOOL PALLET, George R. Slivon, et. al., Owner of Record: *Snap-on Tools Corp., Kenosha, Wis.,* Attorney or Agent: J. Terry Stratman, Ex. Gp.: 3624

5,548,971, Re. S.N. 09/134,172, Aug. 14, 1998, Cl. 62/324, METHOD FOR USE OF LIQUID VAPOR AMMONIA ABSORPTION SYSTEMS IN UNITARY HVAC SYSTEMS, Uwe Rockenfeller, et. al., Owner of Record: *Rocky Research,* Attorney or Agent: Jerry R. Seiler, Ex. Gp.: 3404

5,571,410, Re. S.N. 09/127,556, Jul. 30, 1998, Cl. 210/198.2, FULLY INTEGRATED MINIATURIZED PLANAR LIQUID SAMPLE HANDLING AND ANALYSIS DEVICE, Sally A. Swedberg, et. al., Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.,* Attorney or Agent: Philip S. Yip, Ex. Gp.: 1306

5,605,499, Re. S.N. 08/960,431, Oct. 29, 1997, Cl. 451/433, FLATTENING METHOD AND FLATTENING APPARATUS OF A SEMICONDUCTOR DEVICE, Misuo Sugiyama, et. al., Owner of Record: *Speedfam Co. Ltd., Tokyo, Japan,* Attorney or Agent: Manabu Kanesaka, Ex. Gp.: 3203

5,641,307, Re. S.N. 09/128,472, Aug. 4, 1998, Cl. 439/606, ELECTRICAL CONNECTOR, Al Gerrans, Owner of Record: *A-G Geophysical Products, Inc., Cypress, Tex.,* Attorney or Agent: Matthew E. Burr, Ex. Gp.: 3202

5,700,051, Re. S.N. 09/126,073, Jul. 30, 1998, Cl. 297/188.110, INFORMATION CARD MOUNTED TO A CHAIR, Thomas J. Newhouse, Owner of Record: *Herman Miller Inc., Zeeland, Mich.,* Attorney or Agent: Andrew D. Stover, Ex. Gp.: 3624

5,702,979, Re. S.N. 09/134,727, Aug. 17, 1998, Cl. 437/187, METHOD OF FORMING A LANDING PAD STRUCTURE IN AN INTEGRATED CIRCUIT, Tsiu C. Chan, et. al., Owner of Record: *SGS-Thompson Microelectronics Inc., Carrollton, Tex.,* Attorney or Agent: Dan Venglarik, Ex. Gp.: 2812

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,002,482, Re. S.N. 90/005,053, Jul. 30, 1998, Cl. 431/277, SELECTIVELY ACTUATABLE LIGHTER, Floyd B. Fairbanks, et. al., Owner of Record: *Bic Corp., Milford, Conn.,* Attorney or Agent: John J. Normile, Pennie and Edmonds, New York, N.Y., Ex. Gp.: 3743, Requester: R. Joseph Trojan, Beverly Hills, Calif.

5,165,917, Re. S.N. 90/005,051, Jul. 31, 1998, Cl. 424/070.12, EYE MAKEUP REMOVER WITH TWO SEPARATE PHASES, Arlette Zabotto, et. al., Owner of Record: *Societe Anonyme Dite: L'Oreal, Paris, France,* Attorney or Agent: Richard L. Treanor, Oblon Spivak McClelland Maier and Neustadt, Arlington, Va., Ex. Gp.: 1615, Requester: Owner

5,180,551, Re. S.N. 90/005,049, Jul. 29, 1998, Cl. 420/511, GOLD ALLOYS OF EXCEPTIONAL YELLOW COLOR AND REVERSIBLE HARDNESS, Dwarika P. Agarwal, Owner of Record: *Leach & Garner Co., North Attleborough, Mass. and Fleet Precious Metals, Inc., Providence, R.I.,* Attorney or Agent: Peter K. Sommer, Phillips Lytle Hitchcock Blaine & Huber, Buffalo, N.Y., Ex. Gp.: 1742, Requester: I. Morley Drucker, Fulwider Patton Lee & Utecht, Los Angeles, Calif.

5,545,241, Re. S.N. 90/005,050, Jul. 29, 1998, Cl. 055/490, AIR CLEANER, Raymond Vanderauwera, et. al., Owner of Record: *Donaldson Co. Inc., Minneapolis, Minn.,* Attorney or Agent: Merchant Gould Smith Edell Welter and Schmidt, Minneapolis, Minn., Ex. Gp.: 1724, Requester: Owner

5,654,451, Re. S.N. 90/005,048, Jul. 29, 1998, Cl. 554/035, AMINO ACIDS AND PEPTIDES HAVING MODIFIED C-TERMINALS AND MODIFIED N-TERMINALS, U. Prasad Kari, Owner of Record: *Magainin Pharmaceuticals Inc., Plymouth Meeting, Pa.,* Attorney or Agent: Finnegan Henderson Farabow Garrett and Dunner, Washington, D.C., Ex. Gp.: 1621, Requester: Owner

5,687,809, Re. S.N. 90/005,052, Jul. 31, 1998, Cl. 180/297, LIFT TRUCK WITH TELESCOPIC ARM, Marcel Claude Braud, Owner of Record: *Manitou B.F., S.A., Atlantique, France,* Attorney or Agent: Thomas W. Perkins, Young and Thompson, Arlington, Va., Ex. Gp.: 3611, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
August 10, 1998
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
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Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
Deputy Assistant Commissioner for Patents (Acting)

Public User Identification Passes USPTO Public Search Facilities

The USPTO Public Search Services Division, responsible for the public search facilities in the Patent Search Room and the Trademark Search Library, is installing the new User Identification Pass system announced in the *Official Gazette* dated January 6, 1998. This system will replace the current passes used in the facilities with a new user number and a laminated identification badge. Later reissues of the badge are expected to add a photo of the user. Badges will be reissued every January upon validating and updating identification information. Information will be digitally stored so that validation and reissue will be speedy. There is a $15 fee for replacement of lost or forgotten badges; first issue and annual reissues are without fee. Badges must be visible at all times within the Patent Office building complex. The new user numbers will be used by the File Information Unit for public users requesting and checking out files.

Patrons using the Patent and Trademark Public Search Facilities as well as office areas must obtain a new badge before entering the Patent and Trademark Office complex. The process takes five to ten minutes for a first time issue. Effective immediately, equipment is available to issue the new badges for both patent and trademark public users at the Patent Search Room Reception Desk in Crystal Plaza 3, Lobby. The Patent Search Room is open Monday through Friday from 8 AM to 8 PM. The new User Passes will be required after August 15, 1998; old passes will not be valid after this date.

August 3, 1998

WESLEY H. GEWEHR
Administrator
for Information Dissemination

Patent Terms Extended Under 35 U.S.C. § 156

Certificates extending the terms of the following patents were issued on September 2, 1998.

U.S. Patent No. 4,309,445; Granted January 5, 1982, to Wurtman et al.; Owner of Record: Massachusetts Institute of Technology; Title: D-Fenfluramine for Modifying Feeding Behavior; Classification: 514/654; Product Trade Name: REDUX™ (dexfenfluramine hydrochloride); Original Expiration Date: June 16, 2000; Term Extended: 1,343 days; Extended Expiration Date: February 19, 2004.

U.S. Patent No. 4,572,912; Granted February 25, 1986, to Takao Yoshioka et al.; Owner of Record: Sankyo Company Limited; Title: Thiazolidine Derivatives, Their Preparation and Compositions Containing Them; Classification: 514/369; Product Trade Names: PRELAY™ and REZULIN™ (troglitazone); Original Expiration Date: August 28, 2004; Term Extended: 1,534 days; Extended Expiration Date: November 9, 2008.

U.S. Patent No. 4,599,353; Granted July 8, 1986, to Laszlo Z. Bito; Owner of Record: The Trustees of Columbia University in the City of New York; Title: Use of Eicosanoids and Their Derivatives for Treatment of Ocular Hypertension and Glaucoma; Classification: 514/530; Product Trade Name: XALATAN Sterile Ophthalmic Solution™ (latanoprost); Original Expiration Date: July 8, 2003; Term Extended: 1,116 days; Extended Expiration Date: July 28, 2009.

U.S. Patent No. 4,873,259; Granted October 10, 1989, to James B. Summers et al.; Owner of Record: Abbott Laboratories; Title: Indole Benzofuran, Benzothiophene Containing Lipoxygenase Inhibiting Compounds; Classification: 514/433; Product Trade Name: ZYFLO™ (zileuton); Original Expiration Date: February 10, 2007; Term Extended: 1,398 days; Extended Expiration Date: December 9, 2010.

U.S. Patent No. 4,895,841; Granted January 23, 1990, to Hachiro Sugimoto et al.; Owner of Record: Eisai Co., Ltd.; Title: Cyclic Amine Compounds with Activity Against Acetylcholinesterase; Classification: 514/212; Product Trade Name: ARICEPT™ (donepezl 1 hydrochloride); Original Expiration Date: June 20, 2008; Term Extended: 888 days; Extended Expiration Date: November 25, 2010.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Parts 2 and 3

[Docket No. 970428100-8199-03]

RIN 0651-AA87

Miscellaneous Changes to Trademark Trial and Appeal Board Rules

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office (PTO) is amending the rules governing practice before the Trademark Trial and Appeal Board (Board). The amendments provide for the opening and the length of the discovery period; specify that the automatic disclosure provisions of the Federal Rules of Civil Procedure do not apply to Board proceedings; state that the Board will not hold any person in contempt or award any expenses to any party; specify requirements for briefs on motions; enlarge the time for filing a response to a motion for summary judgment; specify the time for filing motions under Rule 56(f) of the Federal Rules of Civil Procedure (motions for discovery to enable parties to respond to motions for summary judgment); and specify the time for filing motions to compel and motions to test the sufficiency of an answer or objection to a request for admission. In addition, the amendments clarify the rules, conform the rules to current practice, simplify practice, and correct cross-references.

DATES: Effective Date: These rule amendments will be effective October 9, 1998.

Applicability Dates: Two of the provisions of amended §2.120(a) (the provisions that the Board will specify the opening date for discovery and that the discovery period will be set for

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a period of 180 days), will not apply in cases in which a trial order has been issued by the Board prior to October 9, 1998. The provision of amended §2.120(e)(1) that a motion to compel must be filed prior to the commencement of the first testimony period, as originally set or as reset, will apply only in those cases in which trial dates, beginning with the closing date for the discovery period, are set or reset on or after October 9, 1998. Similarly, the provision of amended §2.120(h)(1) that a motion to determine the sufficiency of an answer or objection to a request for admission must be filed prior to the commencement of the first testimony period, as originally set or as reset, will apply only in those cases in which trial dates, beginning with the closing date for the discovery period, are set or reset on or after October 9, 1998.

FOR FURTHER INFORMATION CONTACT: Ellen J. Seeherman, Administrative Trademark Judge, Trademark Trial and Appeal Board, by telephone at (703) 308-9300, extension 206; or bymail marked to her attention and addressed to Assistant Commissioner for Trademarks, Box TTAB-No Fee, 2900 Crystal Drive, Arlington, Virginia 22202-3513; or by facsimile transmission marked to her attention and sent to (703) 308-9333.

SUPPLEMENTARY INFORMATION: A Notice of Proposed Rulemaking was published in the Federal Register (62 FR 30802) on June 5, 1997, and in the Official Gazette of the Patent and Trademark Office (1199 TMOG 88) on June 24, 1997. The purpose of the proposed rule amendments was to improve practice and expedite proceedings in inter partes cases before the Board, codify and clarify certain practices of the Board, and correct certain cross-references to citations of the Trademark Act of 1946 and the Code of Federal Regulations.

In response to a request for written comments, thirty-four written comments were received. Many of the comments suggested that a public hearing be scheduled. As a result, the PTO gave notice in the November 4, 1997 Federal Register (62 FR 59640), and in the November 25, 1997 Official Gazette (1204 TMOG 88), of a public hearing on the proposed rules, and reopened the comment period. At the same time, the PTO announced that it was withdrawing two of the rule amendments proposed in the June 5, 1997 Notice of Proposed Rulemaking. Those withdrawn amendments were to §§2.120(d)(2) and 2.120(h) to limit the number of requests for production of documents and requests for admission, respectively, which may be served in an inter partes proceeding before the Board.

At the public hearing, held on December 17, 1997, seven witnesses testified. The written and oral comments represent the views of 29 individuals and law firms and five trademark law associations, namely, the Intellectual Property Law Section of the American Bar Association, the American Intellectual Property Law Association, the Intellectual Property Law Section of The District of Columbia Bar, the New York Intellectual Property Law Association, and the International Trademark Association. A number of rule amendments suggested in the written and oral comments, though meritorious, cannot be adopted at this time because they are outside the scope of the present rulemaking. Some of these suggestions are discussed below; others, particularly suggestions not directed specifically to one of the proposed rule amendments, are not.

Background to Rule Amendments

In recent years there has been a rapid growth in the number of new proceedings filed with the Board, coupled with a marked increase in the number of motions and other papers filed in each inter partes case. As a result, the Board's workload has increased dramatically. Many of the inter partes rule amendments proposed in the Notice of Proposed Rulemaking were specifically designed to help reduce the Board's backlog of pending motions and cases ready for final decision, stem perceived abuses of the rules, and promote expeditious prosecution and defense of cases. These proposed amendments involved substantial changes in Board inter partes practice. For example, amendments were proposed to (1) lengthen the discovery and trial periods, as well as the time for responding to motions and requests for discovery; (2) concomitantly limit the situations in which extensions of these times would be granted; (3) limit the number of requests for production of documents and things and requests for admission which one party could serve upon another in a proceeding; (4) further limit the number of interrogatories which one party could serve upon another; (5) require that interrogatories, requests for production of documents and things, and requests for admission be served in sufficient time for responses to fall due prior to the close of the discovery period; and (6) specify that the filing of a summary judgment motion would not toll the time for the moving party to respond to outstanding discovery requests but would toll the time for the nonmoving party to do so.

A significant number of the individuals and organizations which offered written or oral comments on the proposed rules strongly objected to these substantial changes. Accordingly, the PTO is not going forward with them at this time. Instead, the PTO is going forward only with those proposed rule amendments which involve modest changes in Board practice, or which serve to clarify the rules, codify current practice, or correct cross-references in the rules. The Board is considering other measures to deal with its increased workload, including a pilot program to make greater use of telephone conferences in determining pending interlocutory matters and motions. However, the PTO will continue to monitor carefully the problems which gave rise to the Notice of Proposed Rulemaking, and may propose and adopt additional changes in the rules governing Board inter partes practice if necessary.

Discussion of Specific Rules and Response to Comments

The comments, if any, on a specific rule and the response to the comments are provided with the discussion of the specific rule. Comments in support of proposed rule changes generally have not been reported.

Section 2.76(a) now provides, in relevant part, that an amendment to allege use may be filed in an application under Section 1(b) of the Act "at any time between the filing of the application and the date the examiner approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action." The section is amended to delete the phrase "or the date of expiration of the six-month response period after issuance of a final action." Under the amended rule, an amendment to allege use may be filed more than six months after the issuance of a final action, as a result of which the amendment may be filed during the pendency of an appeal. This brings the rule into conformity with current practice, as stated in "Waiver of Trademark Rule 2.76(a)," 1156 TMOG 12 (November 2, 1993).

Section 2.76(g) now provides, in relevant part, that if an amendment to allege use does not meet the minimum requirements specified in §2.76(e), the deficiency may be corrected provided the mark has not been approved for publication "or the six-month response period after issuance of a final action has not expired." It also provides that if an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication "or prior to expiration of the six-month response period after issuance of a final action," the amendment will not be examined. The section is amended to delete the phrases "or the six-month response period after issuance of a final action has not expired" and "or prior to the expiration of the six-month response period after issuance of a final action." This amendment codifies current practice, which allows a deficiency in an amendment to allege use to be corrected subsequent to the six-month response period after issuance of a final action.

Section 2.76(h), which provides that an amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication or expiration of the six-month response period after issuance of a final action, is amended to delete the phrase "or expiration of the six-month response period after issuance of a final action." As a result of the rule amendment, an amendment to allege use may be withdrawn during the pendency of an appeal. This amendment, too, codifies current practice.

Section 2.85(e) pertains to the filing of certain specified papers, including a petition for cancellation, with a fee which is insufficient because multiple classes in an application or registration

are involved. The section is amended to delete the references to a petition for cancellation, because the matter of an insufficient fee for a petition to cancel a registration having multiple classes is covered, in greater detail, in §2.111(c)(1).

Section 2.87(c) now provides that a request to divide an application may be filed, inter alia, "during an opposition, upon motion granted by the Trademark Trial and Appeal Board." The section is amended to provide also that a request to divide an application may be filed during a concurrent use or interference proceeding. The amendment codifies current practice and corrects an oversight in the rule.

Section 2.87(c) also now provides that a request to divide an application may be filed "at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action." Similarly, this section now provides that a request to divide an application under section 1(b) of the Act may be filed with a statement of use or "at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action." The section is amended to delete the phrase "or the date of expiration of the six-month response period after issuance of a final action" from the two places where it occurs in this section. Under the amended rule, a request to divide may be filed more than six months after the issuance of a final action, as a result of which the request to divide may be filed during the pendency of an appeal. While this amendment was not included in the notice of proposed rulemaking, it corresponds to the amendment to §§2.76(a), (g) and (h), discussed above, and is advantageous to applicants. With this amendment, an applicant may divide out from its application those classes or that portion of the goods or services in a class to which no final refusal or requirement pertains. The divided out application will immediately go forward to publication or registration, as appropriate, and will avoid the delays related to briefing and deciding the issues involved in the appeal.

Section 2.101(d)(1), which includes a cross-reference to "§2.6(1)," is amended to correct the cross-reference to "§2.6(a)(17)."

Section 2.102(d), which now provides that every request to extend the time for filing a notice of opposition should be submitted "in triplicate (original plus two copies)," is amended to delete the words "(original plus two copies)". While a request must be submitted in triplicate, the Board has no need for the original.

Section 2.111(b), which now includes a cross-reference to "section 14(c) or (e)" of the Act, is amended to correct the cross-reference to "section 14(3) or (5)".

Section 2.111(c)(1) now includes a cross-reference to "§§ 2.6(1) and 2.85(e)". The section is amended to correct the cross-reference "§2.6(1)" to "§2.6(a)(16)". The section is further amended to delete the cross-reference to §2.85(e) in view of the amendment to that section.

Section 2.117(a) now provides that whenever it shall come to the attention of the Board "that parties to a pending case are engaged in a civil action which may be dispositive of the case, proceedings before the Board may be suspended until termination of the civil action." The quoted portion of the section is amended to read "that a party or parties to a pending case are engaged in a civil action or another Board proceeding which may have a bearing on the case, proceedings before the Board may be suspended until termination of the civil action or the other Board proceeding." The amendment clarifies the rules and codifies the Board's current practice on suspension of proceedings, which is that a Board proceeding may be suspended if any of the parties is engaged in a civil action or another Board proceeding which may have a bearing on the proceeding.

Comment: One comment suggested that §2.117(a) conclude with the phrase "or the Board proceeding" to correspond to the previous change in that section. That comment also suggested that the rule be modified to allow a third party who has a pending application, or who is a party in a proceeding which has been suspended pending the outcome of the pending case, to apprise the Board of the impact of the suspension on the third party.

Response: The first suggestion has been adopted. The suggested modification to allow third parties to advise the Board about the impact on them of a suspension order goes beyond the scope of the amendment as originally proposed. Moreover, no purpose would be served by allowing third parties to file such impact statements. The Board suspends proceedings when a decision in a civil action or another Board proceeding may have a bearing on the issues in the pending case. That effect would not be altered by any adverse impact which suspension of the proceeding might have upon a third party.

Section 2.117(b) now provides that "Whenever there is pending, at the time when the question of the suspension of proceedings is raised, a motion which is potentially dispositive of the case, the motion may be decided before the question of suspension is considered." The section is amended to clarify that, when a motion to suspend and a motion which is potentially dispositive of the case are both pending, the Board may decide the potentially dispositive motion before the question of suspension is considered, regardless of the order in which the motions were filed.

Comment: One comment suggested modifying the rule to provide that the filing of a potentially dispositive motion automatically suspends proceedings. The comment notes that the suggested modification would save the Board the paperwork involved in issuing a suspension order, and would avoid uncertainty for the parties as to what they should do until the suspension order is received.

Response: The suggested provision is not properly a part of this section, which relates to suspension in view of a civil action or another Board proceeding. Accordingly, the suggestion is discussed in connection with the amendments to §2.127, which concerns motion practice.

Section 2.119(d) now provides, in pertinent part, that the mere designation of a domestic representative does not authorize the person designated to prosecute the proceeding unless qualified under §10.14(a), or qualified under paragraphs (b) or (c) of §10.14 and authorized under §2.17(b). The section is amended to correct an inadvertent error in the rule by deleting the reference to §10.14(c). That section refers to nonresidents, who cannot be domestic representatives.

Section 2.120(a) now provides, in pertinent part, that "The provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference and concurrent use registration proceedings except as otherwise provided in this section." The section is amended to preface this provision with the words "Wherever appropriate," and to specify that the provisions of the Federal Rules of Civil Procedure relating to automatic disclosure, scheduling conferences, conferences to discuss settlement and to develop a plan for discovery, and transmission to the court of a written report outlining the discovery plan, do not apply to Board proceedings. The amendment clarifies the rule, and codifies current Board practice, as expressed in a notice published in the *Official Gazette* in 1994, namely, "Effect of December 1, 1993 Amendments to the Federal Rules of Civil Procedure on Trademark Trial and Appeal Board Inter Partes Proceedings," 1159 TMOG 14 (February 1, 1994).

Comments:

Two comments suggested that all reliance on the Federal Rules of Civil Procedure be severed because, according to the comments, so few of the Federal Rules are still applicable to Board practice.

Response:

The PTO believes that this suggestion goes beyond the scope of the proposed rulemaking. In addition, the PTO is not inclined

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to adopt it because the Board follows a substantial number of the Federal Rules and is guided by court decisions interpreting these rules. Examples of the Federal Rules followed by the Board include those governing pleadings, motions to dismiss, amendments of pleadings, acceptable discovery, summary judgment, and relief from judgment.

Section 2.120(a) also now provides that the Board will specify the closing date for the taking of discovery, and that the opening of discovery is governed by the Federal Rules of Civil Procedure. The section is amended to, inter alia, state that the Board will specify the opening (as well as the closing) date for the taking of discovery; and delete the provision that the opening of discovery is governed by the Federal Rules of Civil Procedure.

Under current Board practice, discovery opens at the times specified in Rules 30, 33, 34 and 36 of the Federal Rules of Civil Procedure as they read prior to the December 1, 1993 amendments to those rules. See "Effect of December 1, 1993 Amendments to the Federal Rules of Civil Procedure on Trademark Trial and Appeal Board Inter Partes Proceedings," 1159 TMOG 14 (February 1, 1994). Thus, interrogatories, requests for production of documents and things, and requests for admission may be served upon the plaintiff after the proceeding commences, and upon the defendant with or after service of the complaint by the Board. Discovery depositions generally may be taken by any party after commencement of the proceeding, except that the Board's permission must be obtained first in certain specified situations. Further, the Board still follows the practice embodied in Rules 33(a), 34(b), and 36(a) of the Federal Rules of Civil Procedure, as they read prior to the December 1, 1993 amendments, that a defendant may serve responses to interrogatories, requests for production of documents and things, and requests for admission either within 30 days after service of a discovery request (35 days if service of the request for discovery is made by first-class mail, "Express Mail," or overnight courier — see §2.119(c)), or within 45 days after service of the complaint upon it by the Board, whichever is later. These practices relating to the opening of discovery and the time for the service of discovery responses by the defendant are complicated, and have been unpopular with practitioners. The specified amendments to the section will simplify the opening of discovery.

Comments:

One organization suggested a provision allowing discovery requests to be served after the filing of a proceeding, with responses to be due 40 days after the mailing by the Board of the notice of institution. One attorney disagreed with the proposal that the Board set the date for the opening of discovery. This attorney asserted that discovery might be necessary to prepare an answer, and that the later opening of the discovery period would inhibit parties who wanted to be diligent in initiating discovery. Another organization agreed with the proposal that the Board set the opening date for discovery, but suggested that the trial order be issued with the notice of institution because discovery might be necessary to properly prepare an answer. One attorney suggested including a provision in the rules to make it clear, in those cases where a proceeding was initiated prior to the effective date of this final rule and was suspended, that the former rules apply unless the parties to the proceeding are expressly notified otherwise.

Response:

The suggestion for a provision allowing discovery requests to be served after the filing of a proceeding, with responses to be due 40 days after the mailing of the notice of institution, has not been adopted. If the suggested provision were adopted, a defendant could be served with discovery requests before it had even been notified of the filing of the proceeding, with the result that the defendant would be surprised and confused. Further, because early served requests might not bear a proceeding number, they would create an administrative burden for the Board, which would have to respond to inquiries regarding the existence, number, and status of the proceeding.

The suggestion that the trial order, which would set the opening of discovery, be sent with the notice of institution of the proceeding has been adopted. It is believed that a defendant will not be prejudiced if it does not have the plaintiff's discovery responses prior to the time it must file its answer, because a defendant may move to amend its answer based upon information obtained through discovery. With respect to the suggestion for including in the rules a specific provision concerning applicability of the amended rules in cases initiated prior to the final rule and then suspended, it is believed that the information concerning the effective date of the rule amendments, as set forth at the beginning of this notice, is sufficient.

Section 2.120(a) is further amended to provide that the discovery period will be set for a period of 180 days, and that the parties may stipulate to a shortening of that period.

Comments:

Two comments believed that the 180-day discovery period would unduly lengthen proceedings. Another comment said that the proposal would shorten the current discovery period and suggested that the discovery period be 270 days. One comment suggested providing that the period could be shortened on a showing of good cause, for example, if the applicant had not yet used its mark, while the parties would have to justify any enlargement, even one that was stipulated, of the discovery period. That comment also suggested a provision that extensions of the discovery period would be denied if a non-party files a notice that the proceeding is delaying its application.

Response:

As indicated above, the PTO has adopted a suggestion that the trial order setting the opening and closing dates for the discovery period be mailed with the notice of institution of the proceeding. With the adoption of this suggestion, the proposed 180-day discovery period will result in a discovery period that is generally the same as that under present practice. Under current practice, discovery in essence opens for the defendant upon the commencement of the proceeding and opens for the plaintiff upon the Board's service of the complaint and the notice of institution. Often, the defendant does not know that a complaint has been filed until it receives this mailing from the Board. The discovery period currently closes 90 days after the mailing of the trial order, which is not done until the defendant's answer has been filed and processed by the Board. The amount of time that currently elapses between the mailing by the Board of the notice of institution (with a copy of the complaint for the defendant) and the issuance of a trial order averages approximately 90 days, with the discovery period set to close 90 days after the issuance of the trial order. Thus, setting the discovery period for 180 days in a trial order which forms part of the institution letter will not, in general, either lengthen or shorten the current discovery period. The suggestion that the discovery period be enlarged to 270 days has not been adopted because all other comments received indicated that a 180 day discovery period was either acceptable or too long.

The suggestion that the section be amended to provide that one party may move to shorten the discovery period has not been adopted. With respect to the example given in the comment, although an opposer may not need substantial discovery from an applicant who has not yet made use of its mark, that applicant may need discovery with respect to the opposer's use. The suggestions for provisions that the parties would have to justify any extension of the discovery period, and that an extension of the discovery period would be denied if a non-party files a notice that the proceeding is delaying his application, are not adopted. The PTO received numerous comments to the effect that extensions of the discovery period were useful in facilitating settlement, and it is the Board's experience that the vast majority of proceedings are settled prior to trial. Although the Board retains its inherent right to deny motions for extensions of time, even if the parties stipulate to the extension, it is believed that it would cause an undue burden on the parties to require them to justify each consented extension of time. The suggestion that a non-party have the right to prevent an extension of the discovery period is beyond the scope of the proposed rules and cannot be considered.

Section 2.120(a) was proposed to be further amended to require that interrogatories, requests for production of documents and things, and requests for admission be served in sufficient time for responses to fall due prior to the close of the discovery period, and that discovery depositions be noticed and taken prior to the close of the discovery period.

Comments:

Five comments disagreed with this proposal. There was concern that the proposed amendment would increase expenses early in the proceedings and by so doing have a negative effect on settlement. It was also suggested that discovery would become more dependent on depositions, again increasing expenses for the parties. In addition, there was concern that the proposed amendment would create difficulties with respect to follow-up discovery, particularly in connection with requests for admission, which are most useful late in the discovery process. One organization also said that the proposal might create an incentive for a mischievous party to wait until the last 30 days of the discovery period to offer up its most damaging documents so that there would be no opportunity for follow-up discovery.

One attorney suggested a modification regarding the service of discovery requests so that, when discovery requests are served by overnight courier, five additional days would not be added to the time for responding to such discovery requests, which is the case under present §2.119(c). Another attorney suggested that §2.120(a) be amended to specify that documents to be served by the parties may be served by fax, and that facsimile signatures are acceptable for all purposes.

Response:

The proposal to require that interrogatories, requests for production of documents and things, and requests for admission be served in sufficient time that responses will fall due prior to the close of the discovery period is withdrawn. The section is instead amended to specify that "discovery depositions must be taken, and interrogatories, requests for production of documents and things, and requests for admission must be served, on or before the closing date of the discovery period as originally set or as reset." The amendment codifies current practice.

The suggestion to amend §2.119(c) to eliminate the five additional days to respond to discovery requests when service of the requests is made by overnight courier goes beyond the scope of the proposed rules, and therefore cannot be considered. But see the final rule notice entitled "Amendment of Trademark Rules Governing Inter Partes Proceedings, and Miscellaneous Amendments of Other Trademark Rules," published in the Federal Register on August 22, 1989, at 54 FR 34886, 34891-34892, and in the Official Gazette on September 12, 1989, at 1106 TMOG 26, 31 (rejecting a suggestion to amend §2.119(c) to provide for the addition of only one day, rather than five, to the prescribed time for taking action when service is made by "Express Mail" or overnight courier). The suggestion to allow service of documents by facsimile is also beyond the scope of the proposed rules.

Section 2.120(a) was proposed to be amended to specify that extensions of the discovery period will be granted only upon stipulation of the parties approved by the Board.

Comments:

Thirteen comments, including those of each of the organizations, disagreed with the proposed amendment. Some of the comments pointed out that there may be genuine business reasons, such as holidays in foreign countries, change of management, and the time required to translate materials and locate documents which may have been archived decades ago, as to why discovery cannot be completed within the time set. Several comments said the proposal would lend itself to abuse, for example, if one side can complete taking discovery in 180 days but the other cannot; it was also suggested that the proposed amendment would promote the practice of ambushing opponents through dilatory conduct and obstreperous tactics. It was also felt that the elimination of extensions of the discovery period absent consent would eliminate flexibility, which was considered a principal advantage of Board proceedings. Most of the comments suggested that the standard for granting an extension remain good cause. Some of those commenting were willing to accept a modification of the current good cause basis for an extension, as long as the basis for extensions was not limited only to stipulation. For example, two comments suggested that extensions be allowed upon a showing of extraordinary circumstances; one attorney suggested that extensions of up to two months be granted for good cause; and an organization suggested keeping the good cause standard but specifying that both parties' discovery obligations would continue while the motion is pending, and that sanctions would be levied against a party abusing the extension process.

One attorney also commented that the Board should specify in the rules, rather than merely indicating in the preamble to the notice of proposed rulemaking, that the Board may reset the discovery period if necessary. Another attorney suggested that provision be made for a party to move for sanctions without first filing a motion to compel to avoid a situation where a party is deprived of follow-up discovery because its adversary is recalcitrant. The example given involved a party which serves discovery promptly, the adversary responds on the last day permitted with evasive answers and objections, weeks of correspondence to resolve the issues ensue, followed by a motion to compel. The attorney suggested that even though the motion to compel is granted, the moving party would be deprived of an opportunity to take follow-up discovery.

Response:

It is clear that most of those commenting want the standard for obtaining extensions to remain good cause and that most of those who suggested a more restricted standard than good cause did so as an alternative to limiting extensions only to situations involving consent. In view of the comments, the proposal to amend the section to provide that extensions of the discovery period will be granted only on stipulation of the parties is withdrawn. The section is instead amended to provide that the discovery period may be extended upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board.

The amended rule codifies the current practice of allowing extensions of the discovery period upon motion showing good cause. However, the Board is mindful of the comments that abuses of the extension process must be curbed. Therefore, the Board will scrutinize carefully any such motions and will consider, in determining whether good cause has been shown, the diligence of the moving party during the discovery period.

Moreover, the rule is amended to specifically state that, if a motion for an extension is denied, the discovery period may remain as set or reset. While the Board has always had the discretion to do this, the explicit statement of this fact in the rules will alert parties to the potential consequences if a motion to extend does not show good cause, and will put them on notice that the Board will not tolerate abuses of the rules. It is hoped that this will avoid some of the games-playing mentioned in the comments, in which a party files a motion for an extension as a strategic move to obtain a delay until the Board decides the motion, even if the requested extension is denied.

With respect to the suggestion that the rule be amended to explicitly state that the Board may reset the discovery period if necessary, it is believed that this is unnecessary, and would, because such a provision is not present in the other rules regarding the setting of time periods, lead to confusion. For example, there is no specific provision that, if a motion to dismiss is filed and the motion is subsequently denied, the Board will reset the time for the defendant to file an answer, although it is Board practice to do so.

The suggestion that a party be permitted to move for sanctions without first filing a motion to compel has not been adopted. The reason cited as the basis for the suggestion is the need to avoid a situation where a party is deprived of follow-up discovery because its adversary is recalcitrant. However, it is the practice of the Board, when granting a motion to compel in such situations, to reset the discovery period, at the request of the moving party, so as to restore (at least for that party) that

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amount of time which would have remained in the discovery period had the discovery responses been made in a timely and proper fashion. See Trademark Trial and Appeal Board Manual of Procedure §403.04 ("TBMP"). Thus, there is no need for the suggested amendment.

Section 2.120(a) was proposed to be amended to provide that responses to interrogatories, requests for production of documents and things, and requests for admission must be served within 40 days from the date of service of such discovery requests, and to specify that the time to respond may be extended only upon stipulation of the parties or upon motion showing extraordinary circumstances approved by the Board.

Comments:

Two organizations and one attorney believed that 30 days was a sufficient time to respond to discovery requests, and both the attorney and one of the organizations thought that the Board's practice should follow the 30-day time period provided by the Federal Rules of Civil Procedure. One organization expressed the concern that this proposal, combined with the proposal to eliminate extensions of the discovery period absent stipulation of the parties, would put too much pressure on the parties to serve discovery requests early in the discovery period, which could have an adverse effect on settlement.

Nine comments disagreed with the proposal to amend the section to provide that the time to provide responses to interrogatories, requests for production of documents and things, and requests for admission may be extended only upon stipulation of the parties or upon motion showing extraordinary circumstances. Several comments expressed the view that this proposal would eliminate flexibility, which was felt to be a principal advantage of Board proceedings. There were concerns that the proposal would favor ITU applicants or those who are discovery-proof; prejudice the party relying on an old, widely used and promoted mark; and encourage harassing discovery. The comments also pointed out that there could be legitimate, but ordinary, business reasons why extensions might be necessary, such as situations where requests have to be translated for foreign entities, businesses which close for vacation, and small businesses which do not have the resources to compile answers within 40 days. There was also concern that the proposal would result in parties giving incomplete responses to meet the deadline.

Response:

The proposal to amend the section to specify that the time to respond to interrogatories, requests for production of documents and things, and requests for admission may be extended only upon stipulation of the parties or upon motion showing extraordinary circumstances is withdrawn. The section is instead amended to specify that the time to respond may be extended upon stipulation of the parties, or upon motion granted by the Board, or by order of the Board. In view thereof, there is no longer a need to enlarge the period for providing responses to these requests. Accordingly, the proposal to enlarge the time to serve responses to 40 days from the date of service of the discovery requests is also withdrawn, and the section is amended to specify that discovery responses must be served within 30 days from the date of service of the discovery requests. The period for responding will thus remain consistent with that provided under the Federal Rules of Civil Procedure.

Section 2.120(a) was proposed to be further amended to include provisions currently found in §2.121(a)(1), in somewhat different form. Specifically, the section was proposed to be amended to provide that the resetting of a party's time to respond to an outstanding request for discovery will not result in the automatic rescheduling of the discovery and/or testimony periods; that the discovery period will be rescheduled only upon stipulation of the parties approved by the Board; and that testimony periods will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion showing extraordinary circumstances granted by the Board. The latter parts of this proposed amendment are withdrawn, for the reasons discussed above in connection with the withdrawal of the proposal to allow extensions of the discovery period only upon stipulation of the parties, and below in connection with the withdrawal of the proposal to amend §§2.121(a)(1) and 2.121(c) to allow the rescheduling or extension of testimony periods only upon stipulation of the parties or a showing of extraordinary circumstances. Only the first portion of the proposed amendment is included in the amended section.

Thus, the section is amended to specify that the resetting of a party's time to respond to an outstanding request for discovery will not result in the automatic rescheduling of the discovery and/or testimony periods, and that such dates will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board. The new provisions are the same as those currently found at the end of §2.121(a)(1). It is believed that §2.120(a), rather than §2.121(a)(1), which governs the scheduling and rescheduling of testimony periods, is the most logical place for these provisions.

Section 2.120(d)(1) now provides, in pertinent part, that the total number of written interrogatories which a party may serve upon another party in a proceeding shall not exceed 75, counting subparts, except that the Board, in its discretion, may allow additional interrogatories upon motion showing good cause, or upon stipulation of the parties. The section was proposed to be amended to lower the interrogatory number limit from 75, counting subparts, to 25, counting subparts, and to delete the references to a motion for leave to serve additional interrogatories.

Comments:

Twenty comments asserted that limiting the number of interrogatories that could be served upon a party to 25, counting subparts, was too restrictive, while thirteen comments stated that parties should be permitted to file a motion for leave to serve additional interrogatories. Those commenting believed that 25 interrogatories was not a sufficient amount to obtain necessary discovery. As a result, it was feared that parties would serve overly broad interrogatories, which would lead to more motions to compel. The comments also asserted that the proposed limit would force parties into taking more depositions, and thus increase the cost of litigating an inter partes proceeding before the Board. Further, the comments noted that depositions are generally not a viable alternative when the adversary is a foreign entity.

Response:

The proposed amendments to lower the number of interrogatories which a party may serve upon another party and to eliminate the provision for a motion for leave to serve additional interrogatories are withdrawn.

Section 2.120(d)(2), which now includes only a provision concerning the place for production of documents and things, was proposed to be amended to limit the number of requests for production of documents and things which a party may serve upon another party to 15, counting subparts, except upon stipulation of the parties.

Comments:

For reasons similar to those given in connection with the objections to lowering the number of interrogatories a party could serve upon another party in a proceeding, twenty-three comments disagreed with the proposal to limit to 15 the number of document production requests that a party could serve.

Response:

The proposed amendment has been withdrawn, as set forth in the notice of hearing and reopening of comment period on the proposed rules, namely, "Miscellaneous Changes to Trademark Trial and Appeal Board Rules," 62 FR 59640 (Nov. 4, 1997), 1204 TMOG 88 (Nov. 25, 1997).

Section 2.120(e), which governs motions to compel discovery, was proposed to be amended to, inter alia, redesignate the present paragraph as (1), and to amend that paragraph to insert, after the first sentence, a new sentence specifying that a motion to compel must be filed within 30 days after the close of the discovery period, as originally set or as reset.

Comments:

Two comments expressed the concern that under the wording of the proposed amendment, motions to compel could not be filed until after the close of the discovery period. It was suggested that instead of stating that the motion must be filed "within" 30 days after the close of the discovery period, the language be changed to "no later than" 30 days after the close of the discovery period. Another comment, while agreeing that it is appropriate to require that motions be filed within a specified time, suggested that there should be flexibility to extend this date.

Response:

The PTO agrees that parties should be allowed to file motions to compel during the discovery period. However, the suggested language has not been adopted because of changes made to proposed §2.120(a). Specifically, §2.120(a) was proposed to be amended to require, inter alia, that interrogatories, requests for production of documents and things, and requests for admission be served in sufficient time for answers to fall due prior to the close of discovery. However, as a result of comments received on the proposed amendment, it has been withdrawn, and §2.120(a) instead has been amended to codify the Board's current practice that discovery depositions must be taken, and interrogatories, requests for production of documents and things, and requests for admissions must be served, on or before the closing date of the discovery period. In the case of written discovery requests served on the last day of the discovery period, responses would not fall due until 30 days after the close of the discovery period (or 35 days if service of the requests was made by mail — See §2.119(c)). In view thereof, a requirement that motions to compel be filed no later than 30 days after the close of discovery is no longer appropriate.

Nevertheless, the PTO still believes that a motion to compel (as well as a motion to test the sufficiency of an answer or objection to a request for admission) deals with pre-trial matters and should be filed and determined prior to trial. Therefore, §2.120(e) is amended to state, in relevant part of redesignated paragraph (e)(1), "The motion must be filed prior to the commencement of the first testimony period as originally set or as reset." Under the amended rule, motions to compel can be filed at any time during the discovery period, and up to the commencement of the first testimony period, as originally set or as reset. The Board, when setting trial dates in cases arising under these rules as amended, intends to schedule an interval of 60 days between the closing date of the discovery period and the opening date of the first testimony period. Accordingly, there will be adequate time to file a motion to compel prior to the opening of the first testimony period even with respect to those discovery requests served on the last day of the discovery period.

Section 2.120(e) is also amended to add a new paragraph, designated (e)(2), specifying, inter alia, that when a party files a motion for an order to compel discovery, the case will be suspended by the Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion, except as otherwise specified in the Board's suspension letter.

Comments:

One organization suggested that the filing of a motion to compel (or a motion to test the sufficiency of an answer or an objection to a request for admission) should automatically suspend proceedings, so that the parties would not have to wait to receive the Board's suspension order. Two comments suggested that the rule should be more specific as to the manner of suspension, and explicitly state that, when the motion is resolved, discovery will be resumed and the moving party will be given more time for discovery if the motion is granted. A law firm commented that the proposed change "would be unnecessary if we keep the discovery at 270 days" and suggested that suspension should occur only if the motion is not decided within 45 days of filing the motion so that there would be pressure on the Board to decide discovery matters promptly.

Response:

The suggestion that the rule should be modified to provide that the filing of a motion to compel will automatically suspend proceedings has not been adopted. The Board must review the motion to ascertain, for example, whether it is timely and meets the minimal requirements for a motion to compel. Proceedings should not be suspended when a motion to compel is not timely or does not meet the minimal requirements for such a motion. Further, if the mere filing of a motion to compel resulted in an automatic suspension of proceedings, parties might be encouraged thereby to file such a motion merely as a strategic move to gain time and/or delay proceedings. The PTO believes that the better practice is for the Board to retain control over the running of the suspension period.

As for the suggestion that the rule specify that the Board will provide additional time for discovery if a motion to compel is granted, the determination of whether discovery dates will be reset varies from situation to situation. For example, if the moving party serves its discovery requests so late in the discovery period that responses will not be due until after the close of the discovery period, that party will not be entitled to time for serving additional discovery requests even if its motion to compel is granted. On the other hand, the moving party may serve its discovery requests early enough in the discovery period that there will be time for follow-up discovery if the adverse party serves timely responses, but the adverse party may not respond, or may serve responses which are insufficient, and the propounding party may be forced to file a motion to compel. In this situation, the Board, at the request of the propounding party, will reset the discovery period to put that party back in the position it would have been in if it had received timely and proper responses. See TBMP §403.04. Because the relief to be granted in connection with a motion to compel (or a motion to test the sufficiency of an answer or an objection to a request for admission) in any given case is highly dependent on the particular facts of that case, the Board must have discretion to determine what relief is appropriate.

The comment that the proposed change "would be unnecessary if we keep the discovery at 270 days" is not understood, because under present practice the discovery period, absent extensions, would rarely amount to 270 days. As for the suggestion that suspension should occur only if a motion to compel is not decided by the Board within 45 days of its filing, thus keeping pressure on the Board, this suggested modification would seem to work a hardship not on the Board, but on the parties. In view of the time allowed under the applicable rules for filing a brief in opposition to a motion, as well as the time involved in the processing of mail within the PTO, a motion to compel is not likely to be determined within 45 days of filing. If a motion to compel is filed shortly before the commencement of the plaintiff's testimony period, and the case is not suspended until 45 days or more after the filing of the motion to compel, the testimony periods would go forward, and the parties would be left in a state of uncertainty as to what action, if any, should be taken. A motion to compel (like a motion to test the sufficiency of an answer or objection to a request for admission) deals with pre-trial matters and should, therefore, be filed and determined prior to trial. The new provisions governing the time for filing a motion to compel and the Board's suspension of proceedings pending the determination of the motion, coupled with the Board's intention to schedule an interval of 60 days between the close of the discovery period and the opening of the first testimony period, will provide for a more orderly administration of the proceeding and allow parties more certainty in scheduling testimony. Accordingly, the suggested modification has not been adopted.

Section 2.120(e) is further amended to provide, in the new paragraph (e)(2), that the filing of a motion to compel shall not toll the time for a party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition.

Comments:

One attorney suggested that the entire proceeding (including the time for responding to outstanding discovery requests or

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for appearing at noticed discovery depositions) should be suspended, or it might create an unfair advantage for the non-moving party. That person was concerned that the non-moving party could serve the same discovery requests as the moving party, and that, even if the Board denied the motion to compel or placed limitations on the required responses, the moving party would have had to respond fully while the non-moving party would not. Another commented that with this amendment a prompt decision on the motion to compel is critical, and suggested telephone conferences to decide the motion.

Response:

The suggested modification has not been adopted. The Board does not believe that the amended rule prejudices the party filing a motion to compel. Because the signature of a party or its attorney to a request for discovery constitutes a certification by the party or its attorney that the request is warranted, consistent with the Federal Rules of Civil Procedure, and not unreasonable or unduly burdensome, a party ordinarily will not be heard to contend that a request for discovery is proper when propounded by the party itself but improper when propounded by its adversary. See TBMP §402.02 and cases cited therein. Thus, if the non-moving party serves the same discovery requests as the moving party, the non-moving party will ordinarily be required to respond to the requests. Moreover, to the extent that the moving party believes that any of the discovery requests served on it are inappropriate, it may object to those requests when it serves its responses. As for the suggestion that telephone conferences be used to decide motions to compel, as indicated previously, the Board is undertaking a pilot program to make greater use of telephone conferences in determining pending interlocutory matters and motions.

Section 2.120(g)(1) now provides, in pertinent part, that "the Board does not have authority to hold any person in contempt or to award any expenses to any party." The section is amended to state that "the Board will not hold any person in contempt or award any expenses to any party." The Board has long taken the position that it does not have authority to award expenses or attorney fees. See *MacMillan Bloedel Ltd. v. Arrow-M Corp.*, 203 USPQ 952, 954 (TTAB 1979); *Fisons Ltd. v. Capability Brown Ltd.*, 209 USPQ 167, 171 (TTAB 1980); *Anheuser-Busch, Inc. v. Major Mud & Chemical Co.*, 221 USPQ 1191, 1195 n. 9 (TTAB 1984); *Luehrmann v. Kwik Kopy Corp.*, 2 USPQ2d 1303, 1305 n. 4 (TTAB 1987); *Fort Howard Paper Co. v. G.V. Gambina Inc.*, 4 USPQ2d 1552, 1554 (TTAB 1987); *Nabisco Brands Inc. v. Keebler Co.*, 28 USPQ2d 1237, 1238 (TTAB 1993). *Cf. Driscoll v. Cebalo*, 5 USPQ2d 1477, 1481 (Bd. Pat. Int. 1982), *aff'd in part, rev'd in part*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984); *Clevenger v. Martin*, 1 USPQ2d 1793, 1797 (Bd. Pat. App. & Int. 1986). However, in 1995 the PTO, by final rule notice published in the **Federal Register** of March 17, 1995, at 60 FR 14488, and in the *Official Gazette* of April 11, 1995, at 1173 TMOG 36, amended Patent Rule 1.616, 37 CFR §1.616, which concerns the imposition of sanctions in proceedings before the Board of Patent Appeals and Interferences (Patent Board), to provide for the imposition of a sanction in the form of compensatory expenses and/or compensatory attorney fees. 37 CFR 1.616(a)(5) and 1.616(b). The final rule acknowledged the foregoing decisions but concluded, based on a detailed analysis of the Commissioner's authority to issue regulations imposing sanctions, that the Commissioner has the authority to promulgate a rule authorizing imposition of compensatory monetary sanctions.

It is believed that the adoption of a rule authorizing the Board to impose a sanction in the form of compensatory expenses and/or compensatory attorney fees would result in an increase in the number of papers and motions filed in proceedings before the Board. For this reason, and in order to harmonize §2.120(g)(1) with §1.616, §2.120(g)(1) is amended to substitute a statement that the Board "will not" hold any person in contempt or award any expenses to any party, for the statement that the Board "does not have authority" to hold any person in contempt or award any expenses to any party. Section 2.127(f), which now states in pertinent part that the Board "does not have authority to hold any persons in contempt, or to award attorneys' fees or other expenses to any party," is amended in the same manner.

Comments:

Five comments suggested that the rule be amended not only to indicate that the Board has authority to award expenses as a sanction, but also to provide that the Board will exercise this sanctioning power. They stated that awarding expenses would be an effective tool for combating improper motions and other abuses by parties and their attorneys. One organization, while approving of the proposed amendment not to award monetary sanctions, urged the Board to make more effective use of the sanctioning powers it will exercise by using its power more often and publishing decisions in which sanctions are imposed.

Response:

As indicated above, it is believed that the adoption of a rule authorizing the Board to impose a sanction in the form of compensatory expenses and/or compensatory attorney fees would result in the filing of many motions for such sanctions (as well as a large number of associated papers concerning the appropriate amount for such expenses and/or fees), thus increasing the workload of the Board. Accordingly, this suggestion has not been adopted. However, the Board plans to follow the suggestion that it use its other sanctioning powers more often, and that it publish more decisions in which it enters sanctions. It is hoped that these steps will make practitioners aware of the Board's lack of tolerance for abuses and lead to a curtailment of abuses.

Section 2.120(h), which concerns requests for admission, was proposed to be amended to redesignate the present paragraph as (h)(2); delete the first sentence, which reads "Requests for admissions shall be governed by Rule 36 of the Federal Rules of Civil Procedure except that the Trademark Trial and Appeal Board does not have authority to award any expenses to any party."; add to the beginning a new sentence reading "Any motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission must be filed within 30 days after the close of the discovery period, as originally set or as reset."; and revise the beginning of the second sentence, which now reads, "A motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission shall . . ." to read "The motion shall . . ."

The section was proposed to be further amended to add a new paragraph, designated (h)(1), limiting the number of requests for admission which a party may serve upon another party, in a proceeding, to 25, counting subparts. Specifically, the proposed new paragraph provided that the total number of requests for admission which a party may serve upon another party pursuant to Rule 36 of the Federal Rules of Civil Procedure, in a proceeding, shall not exceed 25, counting subparts, except upon stipulation of the parties; that if a party upon which requests for admission have been served believes that the number of requests served exceeds the limitation specified in the paragraph, and is not willing to waive this basis for objection, the party shall, within the time for (and instead of) serving answers and specific objections to the requests, serve a general objection on the ground of their excessive number; and that if the inquiring party, in turn, files a motion to determine the sufficiency of the objection, the motion must be accompanied by a copy of the set(s) of requests for admission which together are said to exceed the limitation, and must otherwise comply with the requirements of paragraph (h)(2) of the section. The proposed provisions paralleled the provisions of §2.120(d)(1), which limit the number of interrogatories which a party may serve upon another party in a proceeding.

Finally, §2.120(h) was proposed to be amended to add another new paragraph, designated (h)(3), which provided for the suspension of proceedings when a motion to determine the sufficiency of an answer or objection to a request for admission is filed. Specifically, the proposed new paragraph provided that when a party files a motion to determine the sufficiency of an answer or objection to a request made by that party for an admission, the case will be suspended by the Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion, except as otherwise specified in the Board's suspension order. The proposed new paragraph also provided that the filing of a motion to determine the sufficiency of an answer or objection to a request for admission shall not toll the time for a party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition. The provisions of proposed new §2.120(h)(3) paralleled the provisions of proposed new §2.120(e) and §2.127(d).

Comments:

Nineteen comments were received which objected to the proposed limit on requests for admission. The comments noted that requests for admission are useful in limiting issues for trial and for streamlining the introduction of documentary evidence. In addition, the comments raised objections similar to those made in response to the proposal to amend §2.120(d)(1) to lower the number of interrogatories which one party may serve upon another in a proceeding.

Response:

As a result of the comments received, the proposed amendment to limit requests for admission has been withdrawn. See the notice of hearing and reopening of comment period on the proposed rules, namely, "Miscellaneous Changes to Trademark Trial and Appeal Board Rules," 62 FR 59640 (Nov. 4, 1997), 1204 TMOG 88 (Nov. 25, 1997) (stating the PTO's intention to withdraw this proposal). Accordingly, the rule is not being amended to include the proposed new first paragraph; the present paragraph will remain but is redesignated (h)(1), and the proposed paragraph (h)(3) is added but redesignated (h)(2). These amendments are described in more detail below.

Section 2.120(h), redesignated as (h)(1), is amended to delete the first sentence, which reads "Requests for admissions shall be governed by Rule 36 of the Federal Rules of Civil Procedure except that the Trademark Trial and Appeal Board does not have authority to award any expenses to any party." The sentence suggests that the only provision in Federal Rule 36 which does not apply in Board proceedings is that pertaining to the awarding of expenses. However, there are also other provisions in Rule 36 which do not apply in Board proceedings. Moreover, §2.120(a), as amended herein, specifies that whenever appropriate, the provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference, and concurrent use registration proceedings, except as otherwise provided in §2.120. Further, §§2.120(g)(1) and 2.127(f), as amended herein, provide that the Board will not hold any person in contempt or award expenses to any party. Accordingly, the first sentence of §2.120(h), redesignated herein as (h)(1), is being deleted because it is confusing and redundant.

It was proposed to amend the second sentence of the present paragraph (now redesignated as §2.120(h)(1)) to add to the beginning of the paragraph a new sentence reading "Any motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission must be filed within 30 days after the close of the discovery period, as originally set or as reset." For the reasons stated above in connection with §2.120(e)(1), governing motions to compel, the paragraph is instead amended to include a new first sentence reading, "Any motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission must be filed prior to the commencement of the first testimony period, as originally set or as reset." The amendment parallels a similar amendment to §2.120(e).

Present **§2.120(h),** redesignated as §2.120(h)(1), is further amended to revise the beginning of the second sentence, which now reads, "A motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission shall . . .," to read "The motion shall . . ."

Section 2.120(h) is amended to add a new paragraph, proposed to be designated as (h)(3) but, with the withdrawal of the proposal to limit requests for admission, now designated (h)(2). This new paragraph provides for the suspension of proceedings when a motion to determine the sufficiency of an answer or objection to a request for admission is filed. Specifically, the paragraph provides that when a party files a motion to determine the sufficiency of an answer or objection to a request for an admission, the case will be suspended by the Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion, except as otherwise specified in the Board's suspension order. The paragraph further provides that the filing of a motion to determine the sufficiency of an answer or objection to a request for admission shall not toll the time for a party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition. The amendment parallels a similar amendment to §2.120(e). The comments submitted (and discussed above) in connection with the amendment to §2.120(e) were considered also in connection with this amendment, with the same outcome.

Section 2.121(a)(1) now provides, inter alia, that testimony periods may be rescheduled "by stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board." The sentence was proposed to be amended to provide that testimony periods may be rescheduled "by stipulation of the parties approved by the Board, or upon motion showing extraordinary circumstances granted by the Board." Similarly, **§2.121(c)** now provides, inter alia, that testimony periods may be extended "by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion granted by the Board, or by order of the Board." The sentence was proposed to be amended to provide that testimony periods may be extended "by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion showing extraordinary circumstances granted by the Board." The proposed amendments would have eliminated extensions or rescheduling upon motion showing good cause.

Comments:

Thirteen comments, including those from four organizations, disagreed with the proposal to eliminate the good cause standard for extending or rescheduling the testimony periods. The reasons given included that there could be many genuine business reasons, or unforeseen developments, why extensions would be necessary, but which would not rise to the level of extraordinary circumstances. Some of the comments suggested allowing one 30-day extension for good cause, or extensions for up to 2 months on a showing of good cause, or extensions on good cause with sanctions for abuse. Three attorneys from the same law firm suggested that the rule should provide for the grant of one extension as of right, and further extensions on a showing of good cause. One attorney suggested changing the pertinent sentence in §2.121(a)(1) to read "Testimony periods may be rescheduled or extended as provided for in 37 CFR 2.121(c)" to avoid duplication. That same attorney also suggested providing for a non-party to object to a stipulated rescheduling or enlargement of testimony when the proceeding is delaying an application by a non-party or delaying another proceeding in which the non-party has an interest.

Response:

The proposal to amend §§2.121(a)(1) and 2.121(c) to eliminate the good cause standard for motions to reschedule or extend the testimony periods is withdrawn. As for the suggestion that one rescheduling or extension of the testimony periods be granted without any showing of cause, the Board does not believe this is warranted since the proposed amendments have been withdrawn. Moreover, once an inter partes proceeding commences, no other extensions of time are granted as of right. With respect to the suggestion to reword the pertinent sentence in §2.121(a)(1) to refer to §2.121(c), it is believed that the clarity offered in setting forth the bases for the rescheduling of testimony periods in §2.121(a)(1) is helpful to the parties. The suggestion that a non-party be permitted to object to a rescheduling of the testimony periods is beyond the scope of the proposed rule amendment, and therefore cannot be considered at this time.

Section 2.121(a)(1) is amended to add a new sentence specifying that if a motion to reschedule testimony periods is denied, "the testimony periods may remain as set." The Board has always had the discretion to leave the testimony periods as set when a motion to reschedule is denied. However, it is hoped

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that explicit statement of this fact in the rules will alert parties to the potential consequences if a motion to reschedule does not show good cause, and will put them on notice that the Board will not tolerate abuses of the rules.

Section 2.121(a)(1) now includes a last sentence reading, "The resetting of a party's time to respond to an outstanding request for discovery will not result in the automatic rescheduling of the discovery and/or testimony periods; such dates will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board." The section is amended by deleting this sentence, which has been added to §2.120(a). It is believed that §2.120(a), which governs, inter alia, extensions of time to respond to discovery requests, is the most logical place for the sentence.

Comment:

One attorney suggested that the rule provide that if the discovery period is rescheduled, the start of the testimony period should be automatically reset without a party having to make a request or motion.

Response:

Such a provision appears as the fourth sentence of present §2.121(a)(1), and will remain in the amended rule as the last sentence of the paragraph.

Section 2.121(c), which governs the length of the testimony periods, was proposed to be amended to enlarge the rebuttal testimony period from 15 to 30 days, and to enlarge all other testimony periods from 30 to 60 days.

Comments:

Four comments disagreed with this proposal, stating that the existing trial periods are adequate, that 60 days is rarely needed to complete testimony, and that most trials in trademark litigation are conducted in one to two weeks or less. It was also felt that enlarging the testimony periods would unduly lengthen inter partes proceedings.

Response:

The proposal to lengthen the testimony periods was tied to the proposal to eliminate good cause extensions of these periods. Because the proposal to eliminate good cause extensions is withdrawn, the proposal to lengthen the testimony periods is also withdrawn.

Section 2.121(c), which now provides, inter alia, that the testimony periods may be extended "by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion granted by the Board, or by order of the Board," was also proposed to be amended to provide that the periods may be extended "by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion showing extraordinary circumstances granted by the Board." The proposed amendment paralleled a similar proposed amendment to §2.121(a)(1), which governs, inter alia, the rescheduling of testimony periods. For the reasons stated in connection with the proposed parallel amendment to §2.121(a)(1), the proposal is withdrawn.

Section 2.121(c) is amended to specify that if a motion to extend the testimony period is denied, "the testimony periods may remain as set."

Comments:

One organization suggested that if the motion were denied, the testimony period should be reset to allow the amount of time which remained when the motion to extend was filed. Three attorneys, all from the same law firm, commented that if prior deadlines are to remain in effect when a motion to extend is denied, the Board needs new procedures to expedite the delivery of motion papers to the Board, and for deciding the motion.

Response:

With respect to the first comment, the PTO believes it is important for the Board to retain discretion as to the rescheduling of testimony periods. There is a concern that, if testimony periods had to be reset to provide the amount of time which was remaining at the time a motion to extend was filed, a party might file a motion for extension as a strategic measure to obtain a delay until the Board decides the motion, even if the motion is ultimately denied. The Board has always had the discretion, if it denied a motion for an extension, to leave the testimony periods as set. It is hoped that specifically stating this fact in this section, as well as in §2.121(a)(1), will alert parties to the potential consequences if a motion to extend does not show good cause, and will put them on notice that the Board will not tolerate abuses of the rules.

As for the need for new procedures to expedite the processing and determination of motions to extend, the telephone pilot program, discussed above, should prove helpful in expediting the rendering of such decisions.

Section 2.121(d) now provides, in pertinent part, that when parties stipulate to the rescheduling of testimony periods or to the rescheduling of the closing date for discovery and the rescheduling of testimony periods, a stipulation "submitted in one original plus as many photocopies as there are parties" will, if approved, be so stamped, signed, and dated, and the copies will be promptly returned to the parties. The section is amended by revising the quoted section to read "submitted in a number of copies equal to the number of parties to the proceeding plus one copy for the Board." The Board does not need the original copy.

Section 2.122(b)(1) now provides, in pertinent part, that each application or registration file specified in a declaration of interference forms part of the record of the proceeding without any action by the parties. The section is amended to clarify the rule by substituting the word "notice" for the word "declaration." A declaration of an interference is issued by the Commissioner upon the granting of a petition filed pursuant to §2.91. An interference proceeding declared by the Commissioner does not commence until the Examining Attorney has determined that all of the subject marks are registrable; all of the marks have been published in the *Official Gazette* for opposition; and the Board mails a "notice of interference" notifying the parties that the interference proceeding is thereby instituted. In the interim between the Commissioner's declaration of an interference and the institution of the proceeding by the Board, some of the applications mentioned in the declaration of interference may become abandoned for one reason or another. When the Board institutes the proceeding, it is only the surviving applications which are specified in the notice of interference, and it is only those application files which form part of the record of the proceeding without any action by the parties.

Section 2.122(d)(1) provides that a registration of the opposer or petitioner pleaded in an opposition or petition to cancel will be made part of the record if the opposition or petition is accompanied "by two copies of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration." The section, which now includes a cross-reference to "§2.6(n)," is amended to correct the cross-reference to "§2.6(b)(4)."

Comment:

A suggestion was made to further amend this section to require that only one status and title copy of a registration be submitted with a notice of opposition. It was pointed out that only one copy of a registration is necessary when it is submitted with a notice of reliance, and it was believed that requiring that two be submitted with a notice of opposition was wasteful.

Response:

A notice of opposition or petition to cancel, together with any exhibits thereto, must be submitted in duplicate. See §§2.104(a) and 2.112(a). This is because the Board places one of the copies in the Board's file of the proceeding, and the other copy is sent to the applicant or registrant with the notification of the institution of the proceeding. Thus, when a plaintiff wishes to make a pleaded registration of record by submitting a status and title copy of the registration with its complaint pursuant to §2.122(d)(1), one copy of the registration must be submitted

with each copy of the complaint. That is, both the complaint, and the status and title copy of the registration, must be submitted in duplicate. A party need only file one copy of a registration with a notice of reliance, on the other hand, because the party itself must separately serve a copy of the notice of reliance and the registration on each adverse party. It may be that the comment was occasioned by a belief that two copies of a pleaded registration must be submitted with each copy of the complaint, for a total of four copies of the registration. That is not the case. To the extent the comment is concerned about the expense of obtaining two status and title copies of a registration from the PTO, the Board does not require that two "originals" be submitted. The section is amended to make this clear by adding as a parenthetical the words "originals or photocopies" after the word "copies", so that the sentence will read, in pertinent part, ". . . if the opposition or petition is accompanied by two copies (originals or photocopies) of the registration prepared and issued by the Patent and Trademark Office . . ."

Section 2.122(d)(2), provides, inter alia, that a registration owned by any party to a proceeding may be made of record by filing a notice of reliance which is accompanied by a copy of the registration prepared and issued by the Patent and Trademark Office showing the current status of and current title to the registration. This section is amended to add, as a parenthetical after the word "copy," the words "original or photocopy", so that the sentence will read, in pertinent part, ". . . a notice of reliance, which shall be accompanied by a copy (original or photocopy) of the registration prepared and issued by the Patent and Trademark Office . . ." This change is consistent with the amendment to §2.122(d)(1).

Section 2.123(b) now provides, in its second sentence, that by agreement of the parties, the testimony of any witness or witnesses of any party may be submitted in the form of an affidavit by such witness or witnesses. The sentence is amended by inserting the word "written" between the words "by" and "agreement." The third sentence of the section now provides that the parties may stipulate what a particular witness would testify to if called, or the facts in the case of any party may be stipulated. The sentence is amended by inserting the words "in writing" after the word "stipulate" and after the word "stipulated." The amendments clarify the rule.

Section 2.123(f) pertains to the certification and filing of a deposition by the officer before whom the deposition was taken. The section now provides, in pertinent part, that the officer certifying a testimony deposition shall, without delay, forward the evidence, notices, and paper exhibits to the Commissioner of Patents and Trademarks. The section is amended to eliminate the requirement that this material be forwarded to the Commissioner "without delay." The section is also amended to state that either the officer or the party taking the testimony deposition, or its attorney or other authorized representative, should forward this material to the Commissioner. Specifically, the third sentence of the second paragraph of the section now reads, "unless waived on the record by an agreement, he shall then, without delay, securely seal in an envelope all the evidence, notices, and paper exhibits, inscribe upon the envelope a certificate giving the number and title of the case, the name of each witness, and the date of sealing, address the package, and forward the same to the Commissioner of Patents and Trademarks." The sentence is amended to delete the words "without delay," to put a period after the word "sealing," and to convert the remainder of the present sentence into a new sentence which reads, "The officer or the party taking the deposition, or its attorney or other authorized representative, shall then address the package and forward the same to the Commissioner of Patents and Trademarks." The fourth sentence of the paragraph now reads, "If the weight or bulk of an exhibit shall exclude it from the envelope, it shall, unless waived on the record by agreement of all parties, be authenticated by the officer and transmitted in a separate package marked and addressed as provided in this section." The sentence is amended to insert, after the word "transmitted," the phrase "by the officer or the party taking the deposition, or its attorney or other authorized representative." Finally, in view of the amendments to the third and fourth sentences, the title of the section, which now reads "Certification and filing by officer," is amended to read "Certification and filing of deposition." To eliminate undesignated text, paragraph (f) of this section has been redesignated.

The amendment eliminating the present requirement that the material be forwarded to the Commissioner of Patents and Trademarks "without delay," conforms the section to current Board practice. While the Board prefers that testimony depositions be submitted promptly, and such depositions are normally filed with the Board at the same time that they are served on the adverse party or parties to the proceeding, it is Board practice to accept transcripts of testimony depositions at any time prior to the rendering of a final decision on the case. The amendment does not affect the requirement of §2.125(a) that one copy of the testimony transcript, together with copies of documentary exhibits and duplicates or photographs of physical exhibits, be served on each adverse party within thirty days after completion of the taking of that testimony. The amendment concerning who is to file the material makes it clear that if the officer sends the envelope or package containing the deposition and associated materials to the party taking the deposition, or to its attorney or other authorized representative, the party, or its attorney or other authorized representative, need not return the envelope or package to the officer for filing with the PTO, but rather may send it directly to the PTO.

Section 2.125(c), which now provides that one certified transcript (of a testimony deposition) and exhibits shall be filed "promptly," with the Board, is amended to delete the word "promptly." The amendment corresponds to the amendment deleting the words "without delay" from §2.123(f), and conforms §2.125(c) to current Board practice.

Section 2.127(a), which governs the filing of briefs on motions, was proposed to be amended to enlarge the time for filing a brief in response to a motion (other than a motion for summary judgment which was covered separately in proposed §2.127(e)(1)) from 15 days to 30 days.

Comments:

Two comments stated that 30 days was too long a period and suggested that 15 or 20 days would be sufficient; a third comment, while not objecting to the enlargement of time, believed that the current time period was not too short.

Response:

The proposal to enlarge the time to respond to a motion which is not a motion for summary judgment was tied to a proposal to amend §2.127(a) to eliminate good cause extensions of this time. Because the proposal to eliminate good cause extensions is withdrawn, as indicated immediately hereafter, the proposal to lengthen the time to respond is also withdrawn.

Section 2.127(a) was proposed to be amended to delete, from the second sentence, a provision for extension of the time to respond to a motion by "order of the Board on motion for good cause" and substitute a provision for an extension by "stipulation of the parties approved by the Board, or upon motion showing extraordinary circumstances granted by the Board."

Comments:

Three comments suggested that the good cause standard be retained, one organization stating that sanctions should be imposed in cases involving abuse. Three attorneys from the same law firm suggested that a first extension of time be granted as of right, and that further extensions be granted upon a showing of good cause.

Response:

Just as the proposals to eliminate good cause as a standard for motions to extend the discovery and discovery response periods (§2.120(a)), and motions to reschedule (§2.121(a)(1)) or extend (§2.121(c)) testimony periods, are withdrawn herein, so too the proposal to eliminate good cause as a standard for obtaining extensions of time to respond to a motion is withdrawn.

Section 2.127(a) is amended to provide that if a motion for an extension of time to file a brief in response to a motion is

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denied, the time for responding to the motion for summary judgment may remain as specified under this section.

Comment:

Three attorneys from the same law firm commented that in view of this amendment, the Board will need some provision for quick processing of the motion papers and for expedited decisions.

Response:

The telephone pilot program, discussed above, should prove helpful in expediting decisions on motions for extensions of time.

Section 2.127(a), which now makes no mention of reply briefs or further papers in support of or in opposition to motions, was proposed to be amended to (1) state that a reply brief, if filed, shall be filed within 15 days from the date of service of the brief in response to the motion; (2) preface this new provision with the phrase "Except as provided in paragraph (e)(1), a" to make clear that this provision does not apply to reply briefs in support of summary judgment motions; and (3) specify that the time for filing a reply brief will not be extended, and that no further papers in support of or in opposition to a motion will be considered by the Board.

Comments:

One organization disagreed with the proposal to amend the section to specify that the time to file a reply brief will not be extended. This organization stated that there was no reason why the circumstances that necessitate an extension of time to file a brief in opposition are less likely to be present when filing a reply brief. As for the prohibition against papers beyond a reply brief, four comments expressed the concern that the moving party will save new issues for its reply, and the party opposing a motion will be at a disadvantage because it will not be able to respond. A suggestion was made to adopt the rule that the reply be limited to rebuttal of points newly raised in the answering brief, and that issues not raised in the moving brief are waived. Another comment suggested that there should either be a provision in the section that no new issues raised in a reply brief will be considered, or the Board should allow for a surreply brief limited to any new issues raised in the reply.

Response:

It is believed that extensions of time to file a reply brief need not be available in the same way that extensions to file a brief in opposition are available, because the circumstances surrounding the filing of a reply brief and a brief in opposition are different. Specifically, while the service of a motion may come as a surprise to a party, the moving party labors under no such obstacle. It must also be acknowledged that reply briefs are generally found to have little persuasive value; often they are a mere reargument of the points made in the main brief. It is the practice of the Board to consider a reply brief only when, in the Board's opinion, such a brief is warranted under the circumstances of a particular case, such as when the Board finds that a reply brief is necessary to permit the moving party to respond to new issues raised in the brief in opposition to the motion, or that the issue to be determined is complex or needs to be further clarified, or that certain arguments against the motion should be answered so as to assist the Board in arriving at a just decision on the motion. See TBMP §502.03. Accordingly, the section is amended as proposed. However, to emphasize that the Board does not intend to encourage the filing of reply briefs, the sentence, "The Board may, in its discretion, consider a reply brief," has been added to the section.

With respect to the concern that the moving party may "save" new issues for its reply brief, the Board is able to recognize what is proper material for a reply brief. However, it is believed that it is not necessary to include a specific provision that "no new issues raised in a reply brief will be considered"; there are no such specific provisions in §2.121(b)(1), which involves the rebuttal testimony period, and §2.128(a)(1), which concerns a reply brief at final hearing.

Section 2.127(a) is further amended to (1) add form requirements for briefs, i.e., that they shall be submitted in typewritten or printed form, double spaced, in at least pica or eleven-point type, on letter-size paper; (2) add a page limitation for briefs, namely, 25 pages for a brief in support of or in response to a motion and 10 pages for a reply brief; and (3) specify that exhibits submitted in support of or in opposition to a motion shall not be deemed to be part of the brief for purposes of determining the length of the brief.

Comments:

One organization thought the page limits were too restrictive, and suggested 35 pages for main briefs and 15 for reply briefs; three comments suggested higher page limits for potentially dispositive motions; one attorney recommended 30- and 15-page limits for summary judgment motions; and an organization suggested a 40-page limit for dispositive motions, pointing out that other courts have 45- and 50-page limits. Two organizations agreed with the proposed page limit, as long as the Board would grant leave to file longer briefs with a good cause showing, such as if there were multiple parties, consolidated proceedings, or multiple marks.

Response:

It is believed that 25 and 10 pages are sufficient for the main brief and reply brief, respectively, of any motion that arises in a Board inter partes proceeding. Because of the limited nature of Board proceedings, briefing for motions in such proceedings need not be as extensive as that in proceedings in court. Although the Board is of the firm opinion that all issues in a motion can be briefed in 25 pages for a main brief, and 10 pages for a reply brief, the rule does not specifically prohibit a motion for leave to file a longer brief upon a showing of good cause. The Board may include such a prohibition as part of a future rulemaking if it appears that parties are abusing such requests.

Section 2.127(b), which now provides, in pertinent part, that any request for reconsideration or modification of an order or decision issued on a motion must be filed within thirty days from the date of the order or decision, is amended to change the specification of the time period for requesting reconsideration or modification from "thirty days" to "one month." The amended rule parallels §2.129(c), which governs the time for filing a request for rehearing or reconsideration or modification of a decision issued after final hearing.

Section 2.127(d) now provides, in its first sentence, that when any party files a motion which is potentially dispositive of a proceeding, the case will be suspended by the Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion. The sentence is amended to add to the end of the sentence the phrase "except as otherwise specified in the Board's suspension order."

Comment:

One organization suggested the section should be amended to provide that the filing of a potentially dispositive motion automatically suspends proceedings, without any action by the Board.

Response:

The suggested modification has not been adopted. A variety of motions are potentially dispositive, including a motion for sanctions in the form of entry of judgment. Because of the number of situations in which a party may make a potentially dispositive motion, it is believed better for the Board to determine whether proceedings should be suspended based on the situation presented by the particular case.

Section 2.127(d) was also proposed to be amended to add a new sentence providing that the filing of a summary judgment motion shall not toll the time for the moving party to respond to any outstanding discovery requests or to appear at a noticed discovery deposition, but it shall toll the time for the nonmoving party to serve such responses or to appear for such deposition.

Comments:

Three comments disagreed with this proposal. They stated that the moving party should not be forced to spend unnecessary time and money to provide discovery responses when the proceeding may be decided on the basis of the pending summary judgment motion. They believed that any discovery that is essential for the non-moving party can be obtained through an FRCP 56(f) motion. Another comment suggested that the non-moving party's obligation to respond to discovery not be tolled by the filing of a summary judgment motion, in that the moving party might require discovery if it were moving for partial summary judgment.

Response:

Upon consideration of the comments regarding the tolling of time for responding to discovery, the proposal to amend §2.127(d) to add the sentence, "The filing of a summary judgment motion shall not toll the time for the moving party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition, but it shall toll the time for the nonmoving party to serve such responses or to appear for such deposition.", is withdrawn.

Section 2.127(e)(1) presently provides that a motion for summary judgment should be filed prior to the commencement of the first testimony period, as originally set or as reset, and that the Trademark Trial and Appeal Board, in its discretion, may deny as untimely any motion filed thereafter. The section is amended to add, at the beginning of the section, a provision that a motion for summary judgment may not be filed until notification of the proceeding has been sent to the parties by the Board. The amendment codifies current Board practice, as set forth in *Nabisco Brands Inc. v. Keebler Co.*, 28 USPQ2d 1237 (TTAB 1993).

Comments:

One comment suggested that parties should be allowed to file summary judgment motions with the pleadings. Another comment suggested that parties be permitted to file summary judgment motions up to the end of a party's testimony period.

Response:

The suggestion that parties be allowed to file summary judgment motions with the pleadings has not been adopted. The Board considers a motion for summary judgment filed prior to the issuance of the notice of institution to be premature. Although the proceeding commences with the filing of the complaint, formal service of the complaint upon the defendant is made by the Board, not by the plaintiff. The Board does not serve the complaint upon the defendant until after the Board has first examined the complaint to determine whether it has been filed in proper form, with the required fee, and then, if so, has (1) obtained the application or registration file which is the subject of the proceeding, (2) set up a proceeding file with an assigned proceeding number, and (3) entered information concerning the proceeding in the electronic records of the PTO. Thus, there is a time gap between the filing of a notice of opposition or petition for cancellation and the issuance of the Board's action notifying the defendant of the filing of the proceeding, notifying both parties of the institution of the proceeding, and forwarding a copy of the complaint to the defendant. Although a plaintiff may send a courtesy copy of the complaint to the defendant, the defendant does not know that the complaint has been filed in proper form, and that the proceeding has been instituted by the Board, until it receives from the Board the notice of institution along with a copy of the complaint: Moreover, the filing of a motion for summary judgment prior to the Board's formal institution of the proceeding may cause administrative difficulties for the Board, particularly where the Board has not yet assigned a proceeding number to the case.

As for the suggestion that parties be permitted to file summary judgment motions up to the end of a party's testimony period, this is beyond the scope of the proposed amendment. Moreover, the suggested modification would defeat the concept of summary judgment, which is a procedure to dispose of a case before trial. Once a party's testimony period has opened, trial has begun. Accordingly, the suggested modification has not been adopted.

Section 2.127(e)(1) is further amended to add provisions specifying that (1) a motion under Rule 56(f) of the Federal Rules of Civil Procedure, if filed in response to a motion for summary judgment, shall be filed within 30 days from the date of service of the summary judgment motion, and (2) the time for filing a motion under Rule 56(f) will not be extended.

Comments:

Three attorneys from one law firm asserted that this amendment would put extraordinary pressure on counsel, and suggested that there be a provision for extensions given the dispositive nature of a summary judgment motion. An organization raised a concern that when a motion to dismiss which is accompanied by affidavits and exhibits is treated as a summary judgment motion it would be difficult for the plaintiff to properly frame a Rule 56(f) motion without having the defendant's answer, and suggested that in such a case the defendant should be required to file its answer before the plaintiff must file a 56(f) motion.

Response:

The PTO believes that 30 days is an adequate time for a party to review a summary judgment motion, determine whether it needs particular discovery in order to respond to the motion, and prepare a motion for such discovery, supported by an affidavit attesting to the reasons for the need for the discovery. With respect to the suggestion, in the motion to dismiss turned motion for summary judgment situation, that the defendant be required to file its answer before the plaintiff must file a 56(f) motion, the Board believes that the plaintiff will be adequately informed of the factual issues regarding the defendant's position by the summary judgment motion and accompanying materials, such that the plaintiff can frame a Rule 56(f) motion.

Section 2.127(e)(1) was also proposed to be amended to provide that if no motion under Rule 56(f) is filed, a brief in response to the motion for summary judgment shall be filed within 60 days from the date of service of the motion, unless the time is extended by stipulation of the parties approved by the Board, or upon motion showing extraordinary circumstances granted by the Board.

Comments:

Two comments disagreed with the proposal to enlarge the period to respond to a summary judgment motion to 60 days, stating that 30 days was adequate. Three comments disagreed with the proposal to allow extensions of the time to file a brief only on consent or a showing of extraordinary circumstances: two suggested a good cause basis, while three comments, by attorneys from the same law firm, suggested that a first extension be allowed as of right, and additional extensions upon a showing of good cause.

Response:

The proposal to amend this section to allow extensions of time to file a brief opposing a motion for summary judgment only on consent or a showing of extraordinary circumstances is withdrawn. The withdrawal of this proposal is consistent with the withdrawals herein of proposals to eliminate good cause as a standard for motions to extend the discovery and discovery response periods (§2.120(a)), motions to reschedule (§2.121(a)(1)) or extend (§2.121(c)) testimony periods, and motions to extend the time to respond to motions other than summary judgment motions (§2.127(a)). The Board practice of granting extensions based on a showing of good cause will continue, and the rule has been amended to specifically state that extensions may be had on this basis. However, the suggestion that a first extension should be granted as of right is not adopted. Once a proceeding has commenced there is no other situation where an extension of time may be obtained without providing any reason whatsoever. It is believed that a good cause standard will not place an undue burden on the parties. As for the proposal to allow 60 days for the filing of a brief

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in response to a motion for summary judgment, §2.127(e)(1) is amended to provide instead that a brief in response to a motion for summary judgment shall be filed within 30 days from the date of service of the motion. The modification is made because of the decision to allow extensions upon a showing of good cause, and because of the comments regarding the time to respond to a summary judgment motion.

Section 2.127(e)(1) is further amended to provide that if a motion for an extension of time to file a brief in response to a motion for summary judgment is denied, the time for responding to the motion for summary judgment may remain as specified under this section.

Comment:

Three attorneys, all of whom are from the same law firm, commented that in view of this amendment, new procedures are needed to expedite the delivery of the motion papers to the Board and for deciding the motion.

Response:

The telephone pilot program, discussed above, should prove helpful in expediting decisions on motions for extensions of time.

Section 2.127(e)(1) now makes no mention of reply briefs or further papers in support of or in opposition to summary judgment motions. It was proposed to amend this section to provide that a reply brief, if filed, shall be filed within 30 days from the date of service of the brief in response to the motion; that the time for filing a reply brief will not be extended; and that no further papers in support of or in opposition to a motion for summary judgment will be considered by the Board.

Comments:

One comment suggested that 15 days was a sufficient time to file a reply brief. One organization disagreed with the proposed provision that the time to file a reply brief will not be extended. This organization stated that there was no reason why the circumstances that necessitate an extension of time to file a brief in opposition are less likely to be present when filing a reply brief. With regard to the prohibition against filing papers beyond a reply brief, one organization raised the concern that the party opposing a motion will be at a disadvantage if the moving party saves new issues for its reply. It suggested that either the rule be amended to provide that new issues raised in a reply brief will not be considered, or that provision be made for a surreply brief which is limited to any new issues raised in the reply.

Response:

The suggestion that a reply brief, if filed, should be filed within 15 days from the date of service of the brief in response to the motion for summary judgment is adopted. The section is otherwise amended as proposed. The amended rule parallels that portion of amended §2.127(a) which pertains to the time for filing reply briefs to other types of motions. With respect to the comment that extensions of time to file a reply brief should be available in the same way that extensions to file a brief in opposition are available, it is believed that the circumstances surrounding the filing of a reply brief and a brief in opposition to a summary judgment motion are different, such that extensions should be permitted in the latter situation and not in the former. Specifically, the service of a motion for summary judgment may come as a surprise to a party, and it may take some time to obtain documents and affidavits in order to show that genuine issues of material fact exist; on the other hand, the party who has moved for summary judgment would have gathered the necessary evidence, and have researched the law prior to filing its motion. It must also be acknowledged that reply briefs are generally found to have little persuasive value; often they are a mere reargument of the points made in the main brief, and as such serve no useful purpose. It is not the practice of the Board to consider a reply brief of that nature. Rather, the Board considers a reply brief only when, in the Board's opinion, such a brief is warranted under the circumstances of a particular case. See, in this regard, the discussion herein of the amendment of §2.127(a) to add matter relating to reply briefs for motions other than summary judgment motions. However, to emphasize that the Board does not intend to encourage the filing of reply briefs, the sentence, "The Board may, in its discretion, consider a reply brief," has been added to the section.

With respect to the concern that the moving party may "save" new issues for its reply brief, the Board is able to recognize what is proper material for a reply brief. However, it is believed that it is not necessary to include a specific provision that "no new issues raised in a reply brief will be considered"; there are no such specific provisions in §2.121(b)(1), which involves the rebuttal testimony period, and §2.128(a)(1), which concerns a reply brief at final hearing.

Section 2.127(f) now provides that "the Board does not have authority to hold any person in contempt, or to award attorneys' fees or other expenses to any party." This section is amended, in conformity with amended §2.120(g)(1), and for the reasons indicated in connection therewith, to state that "the Board will not hold any person in contempt, or award attorneys' fees or other expenses to any party."

Comments:

The comments made with respect to the amendment to §2.120(g)(1) are applicable to this amendment. Five comments concerning §2.120(g)(1) suggested that the rule not only be amended to indicate that the Board has authority to award expenses as a sanction, but also that the rule be amended to provide that the Board will exercise this sanctioning power. They stated that awarding expenses would be an effective tool in combating improper motions and other abuses by parties and their attorneys.

Response:

As indicated in the response to the comments regarding the amendment to §2.120(g)(1), it is believed that the adoption of a rule authorizing the Board to impose a sanction in the form of compensatory expenses and/or compensatory attorney fees would result in the filing of many motions for such sanctions (as well as a large number of associated papers concerning the appropriate amount therefor), thus increasing the workload of the Board. Accordingly, this suggestion has not been adopted. However, the Board is adopting the suggestion that it use its other sanctioning powers more often, and that it publish more decisions in which it enters sanctions. It is hoped that these steps will make practitioners aware of the Board's lack of tolerance for abuses and lead to a curtailment of abuses.

Section 2.134(a), which now includes a cross-reference to "section 7(d)" of the Act of 1946, is amended to correct the cross-reference to "section 7(e)."

Section 2.146(e)(1), which now provides for filing a petition to the Commissioner from the denial of a request for an extension of time to file a notice of opposition, is amended to provide also for filing a petition from the grant of such a request. Specifically, the first sentence of the section is revised to read, "A petition from the grant or denial of a request for an extension of time to file a notice of opposition shall be filed within fifteen days from the date of mailing of the grant or denial of the request. A petition from the grant of a request shall be served on the attorney or other authorized representative of the potential opposer, if any, or on the potential opposer. A petition from the denial of a request shall be served on the attorney or other authorized representative of the applicant, if any, or on the applicant." In addition, the present third sentence of the section, which provides, in pertinent part, that the applicant may file a response within fifteen days from the date of service of the petition and shall serve a copy of the response on the petitioner, is amended by revising the beginning of the sentence to read, "The potential opposer or the applicant, as the case may be, may file a response within fifteen days ***." The amendments to §2.126(e)(1) codify current practice and clarify the rule.

Section 3.41, which now includes a cross-reference to "§2.6(q)," is amended to correct the cross-reference to "§2.6(b)(6)."

Environmental, Energy, and Other Considerations

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Order 12612, and the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501 et seq.). The changes have been determined to be not significant for purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act. 5 U.S.C. 605(b). The principal effect of this rule change is to improve practice and expedite proceedings in inter partes cases before the Board.

The PTO has determined that the rule changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the PRA unless that collection of information displays a currently valid OMB Control Number.

This rule involves collections of information subject to the requirements of the PRA. The rule involves the Petition to Cancel requirement. This requirement has been approved by the Office of Management and Budget (OMB) under OMB control number 0651-0040. The public reporting burden for this collection of information is estimated to be 45 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This rule also involves information requirements associated with filing an Opposition to the Registration of a Mark, Amendment to Allege Use, and dividing an application. These requirements have been previously approved by the OMB under OMB control number 0651-0009. Send comments regarding the burden estimate or any other aspects of the information requirements, including suggestions for reducing the burden, to the Assistant Commissioner for Trademarks, Box TTAB No Fee, 2900 Crystal Drive, Arlington, VA 22202-3513, marked to the attention of Ellen J. Seeherman, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, N.W. Washington, DC 20230 (Attention: PTO Desk Officer).

List of Subjects

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 3

Administrative practice and procedure, Patents, Trademarks.

For the reasons given in the preamble, Part 2 and Part 3 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 2 — RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.76 is amended by revising paragraphs (a), (g), and (h) to read as follows:

§ 2.76 Amendment to allege use.

(a) An application under section 1(b) of the Act may be amended to allege use of the mark in commerce under section 1(c) of the Act at any time between the filing of the application and the date the examiner approves the mark for publication. Thereafter, an allegation of use may be submitted only as a statement of use under § 2.88 after the issuance of a notice of allowance under section 13(b)(2) of the Act. If an amendment to allege use is filed outside the time period specified in this paragraph, it will be returned to the applicant.

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(g) If the amendment to allege use is filed within the permitted time period but does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. The deficiency may be corrected provided the mark has not been approved for publication. If an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication, the amendment will not be examined.

(h) An amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication.

3. Section 2.85 is amended by revising paragraph (e) to read as follows:

§2.85 Classification schedules.

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(e) Where the amount of the fee received on filing an appeal in connection with an application or on an application for renewal is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or renewal application will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

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4. Section 2.87 is amended by revising paragraph (c) to read as follows:

§2.87 Dividing an application.

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(c) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication; or during an opposition, concurrent use, or interference proceeding, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration.

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5. Section 2.101 is amended by revising paragraph (d)(1) to read as follows:

§2.101 Filing an opposition.

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(d)(1) The opposition must be accompanied by the required fee for each party joined as opposer for each class in the application for which registration is opposed (see §2.6(a)(17). If no fee, or a fee insufficient to pay for one person to oppose the registration of a mark in at least one class, is submitted within thirty days after publication of the mark to be opposed or within an extension of time for filing an opposition, the opposition will not be refused if the required fee(s) is submitted to the Patent and Trademark Office within the time limit set in the notification of this defect by the Office.

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6. Section 2.102 is amended by revising paragraph (d) to read as follows:

§2.102 Extension of time for filing an opposition.

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(d) Every request to extend the time for filing a notice of opposition should be submitted in triplicate.

7. Section 2.111 is amended by revising paragraphs (b) and (c)(1) to read as follows:

§2.111 Filing petition for cancellation.

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(b) Any entity which believes that it is or will be damaged by a registration may file a petition, which should be addressed to the Trademark Trial and Appeal Board, to cancel the registration in whole or in part. The petition need not be verified, and may be signed by the petitioner or the petitioner's attorney or other authorized representative. The petition may be filed at any time in the case of registrations on the Supplemental Register or under the Act of 1920, or registrations under the Act of 1881 or the Act of 1905 which have not been published under section 12(c) of the Act, or on any ground specified in section 14(3) or (5) of the Act. In all other cases the petition and the required fee must be filed within five years from the date of registration of the mark under the Act or from the date of publication under section 12(c) of the Act.

(c)(1) The petition must be accompanied by the required fee for each class in the registration for which cancellation is sought (see §2.6(a)(16)). If the fees submitted are insufficient for a cancellation against all of the classes in the registration, and the particular class or classes against which the cancellation is filed are not specified, the Office will issue a written notice allowing petitioner until a set time in which to submit the required fees(s) (provided that the five-year period, if applicable, has not expired) or to specify the class or classes sought to be cancelled. If the required fee(s) is not submitted, or the specification made, within the time set in the notice, the cancellation will be presumed to be against the class or classes in ascending order, beginning with the lowest numbered class, and including the number of classes in the registration for which the fees submitted are sufficient to pay the fee due for each class.

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8. Section 2.117 is amended by revising paragraphs (a) and (b) to read as follows:

§2.117 Suspension of proceedings.

(a) Whenever it shall come to the attention of the Trademark Trial and Appeal Board that a party or parties to a pending case are engaged in a civil action or another Board proceeding which may have a bearing on the case, proceedings before the Board may be suspended until termination of the civil action or the other Board proceeding.

(b) Whenever there is pending before the Board both a motion to suspend and a motion which is potentially dispositive of the case, the potentially dispositive motion may be decided before the question of suspension is considered regardless of the order in which the motions were filed.

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9. Section 2.119 is amended by revising paragraph (d) to read as follows:

§2.119 Service and signing of papers.

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(d) If a party to an inter partes proceeding is not domiciled in the United States and is not represented by an attorney or other authorized representative located in the United States, the party must designate by written document filed in the Patent and Trademark Office the name and address of a person resident in the United States on whom may be served notices or process in the proceeding. In such cases, official communications of the Patent and Trademark Office will be addressed to the domestic representative unless the proceeding is being prosecuted by an attorney at law or other qualified person duly authorized under §10.14(c) of this subchapter. The mere designation of a domestic representative does not authorize the person designated to prosecute the proceeding unless qualified under §10.14(a), or qualified under §10.14(b) and authorized under §2.17(b).

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10. Section 2.120 is amended by redesignating current paragraphs (e) and (h) as (e)(1) and (h)(1), respectively; adding new paragraphs (e)(2) and (h)(2); and revising paragraphs (a), (g)(1) and redesignated paragraphs (e)(1) and (h)(1) to read as follows:

§2.120 Discovery.

(a) *In general.* Wherever appropriate, the provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference and concurrent use registration proceedings except as otherwise provided in this section. The provisions of the Federal Rules of Civil Procedure relating to automatic disclosure, scheduling conferences, conferences to discuss settlement and to develop a discovery plan, and transmission to the court of a written report outlining the discovery plan, are not applicable to Board proceedings. The Trademark Trial and Appeal Board will specify the opening and closing dates for the taking of discovery. The trial order setting these dates will be mailed with the notice of institution of the proceeding. The discovery period will be set for a period of 180 days. The parties may stipulate to a shortening of the discovery period. The discovery period may be extended upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board. If a motion for an extension is denied, the discovery period may remain as originally set or as reset. Discovery depositions must be taken, and interrogatories, requests for production of documents and things, and requests for admission must be served, on or before the closing date of the discovery period as originally set or as reset. Responses to interrogatories, requests for production of documents and things, and requests for admission must be served within 30 days from the date of service of such discovery requests. The time to respond may be extended upon stipulation of the parties, or upon motion granted by the Board, or by order of the Board. The resetting of a party's time to respond to an outstanding request for discovery will not result in the automatic rescheduling of the discovery and/or testimony periods; such dates will be rescheduled only upon stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board.

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(e) *Motion for an order to compel discovery.* (1) If a party fails to designate a person pursuant to Rule 30(b)(6) or Rule 31(a) of the Federal Rules of Civil Procedure; or if a party, or such designated person, or an officer, director or managing agent of a party fails to attend a deposition or fails to answer any question propounded in a discovery deposition, or any interrogatory, or fails to produce and permit the inspection and copying of any document or thing, the party seeking discovery may file a motion before the Trademark Trial and Appeal Board for an order to compel a designation, or attendance at a deposition, or an answer, or production and an opportunity to inspect and copy. The motion must be filed prior to the commencement of the first testimony period as originally set or as reset. The motion shall include a copy of the request for designation or of the relevant portion of the discovery deposition; or a copy of the interrogatory with any answer or objection that was made; or a copy of the request for production, any proffer of production or objection to production in response to the request, and a list and brief description of the documents or things that were not produced for inspection and copying. The motion must be supported by a written statement from the moving party that such party or the attorney therefor has made a good faith effort, by conference or correspondence, to resolve with the other party or the attorney therefor the issues presented in the motion and has been unable to reach agreement. If issues raised in the motion are subsequently resolved by agreement of the parties, the moving party should inform the Board in writing of the issues in the motion which no longer require adjudication.

(2) When a party files a motion for an order to compel discovery, the case will be suspended by the Trademark Trial and Appeal Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion, except as otherwise specified in the Board—s suspension order. The filing of a motion to compel shall not toll the time for a party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition.

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(g) *Sanctions.* (1) If a party fails to comply with an order of the Trademark Trial and Appeal Board relating to discovery, including a protective order, the Board may make any appropriate order, including any of the orders provided in Rule 37(b)(2) of the Federal Rules of Civil Procedure, except that the Board will not hold any person in contempt or award any expenses to any party. The Board may impose against a party any of the sanctions provided by this subsection in the event that said party or any attorney, agent, or designated witness of that party fails to comply with a protective order made pursuant to Rule 26(c) of the Federal Rules of Civil Procedure.

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(h)(1) Any motion by a party to determine the sufficiency of an answer or objection to a request made by that party for an admission must be filed prior to the commencement of the first testimony period, as originally set or as reset. The motion shall include a copy of the request for admission and any exhibits thereto and of the answer or objection. The motion must be supported by a written statement from the moving party that such party or the attorney therefor has made a good faith effort, by conference or correspondence, to resolve with the other party or the attorney therefor the issues presented in the motion and has been unable to reach agreement. If issues raised in the motion are subsequently resolved by agreement of the parties, the moving party should inform the Board in writing of the issues in the motion which no longer require adjudication.

(2) When a party files a motion to determine the sufficiency of an answer or objection to a request made by that party for an admission, the case will be suspended by the Trademark Trial and Appeal Board with respect to all matters not germane to the motion, and no party should file any paper which is not germane to the motion, except as otherwise specified in the Board's suspension order. The filing of a motion to determine the sufficiency of an answer or objection to a request for admission shall not toll the time for a party to respond to any outstanding discovery requests or to appear for any noticed discovery deposition.

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11. Section 2.121 is amended by revising paragraphs (a)(1), (c) and (d) to read as follows:

§2.121 Assignment of times for taking testimony.

(a)(1) The Trademark Trial and Appeal Board will issue a trial order assigning to each party the time for taking testimony. No testimony shall be taken except during the times assigned, unless by stipulation of the parties approved by the Board, or, upon motion, by order of the Board. Testimony periods may be rescheduled by stipulation of the parties approved by the Board, or upon motion granted by the Board, or by order of the Board. If a motion to reschedule testimony periods is denied, the testimony periods may remain as set. The resetting of the closing date for discovery will result in the rescheduling of the testimony periods without action by any party.

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(c) A testimony period which is solely for rebuttal will be set for fifteen days. All other testimony periods will be set for thirty days. The periods may be extended by stipulation of the parties approved by the Trademark Trial and Appeal Board, or upon motion granted by the Board, or by order of the Board. If a motion for an extension is denied, the testimony periods may remain as set.

(d) When parties stipulate to the rescheduling of testimony periods or to the rescheduling of the closing date for discovery and the rescheduling of testimony periods, a stipulation presented in the form used in a trial order, signed by the parties, or a motion in said form signed by one party and including a statement that every other party has agreed thereto, and submitted in a number of copies equal to the number of parties to the proceeding plus one copy for the Board, will, if approved, be so stamped, signed, and dated, and a copy will be promptly returned to each of the parties.

12. Section 2.122 is amended by revising paragraphs (b)(1), (d)(1) and (d)(2) to read as follows:

§2.122 Matters in evidence.

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(b) *Application files.* (1) The file of each application or registration specified in a notice of interference, of each application or registration specified in the notice of a concurrent use registration proceeding, of the application against which a notice of opposition is filed, or of each registration against which a petition or counterclaim for cancellation is filed forms part of the record of the proceeding without any action by the parties and reference may be made to the file for any relevant and competent purpose.

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(d) *Registrations.* (1) A registration of the opposer or petitioner pleaded in an opposition or petition to cancel will be received in evidence and made part of the record if the opposition or petition is accompanied by two copies (originals or photocopies) of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration. For the cost of a copy of a registration showing status and title, see §2.6(b)(4).

(2) A registration owned by any party to a proceeding may be made of record in the proceeding by that party by appropriate identification and introduction during the taking of testimony or by filing a notice of reliance, which shall be accompanied by a copy (original or photocopy) of the registration prepared and issued by the Patent and Trademark Office showing both the current status of and current title to the registration. The notice of reliance shall be filed during the testimony period of the party that files the notice.

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13. Section 2.123 is amended by revising paragraphs (b) and (f) as follows:

§2.123 Trial testimony in inter partes cases.

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(b) *Stipulations.* If the parties so stipulate in writing, depositions may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions. By written agreement of the parties, the testimony of any witness or witnesses of any party, may be submitted in the form of an affidavit by such witness or witnesses. The parties may stipulate in writing

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what a particular witness would testify to if called, or the facts in the case of any party may be stipulated in writing.

*****

(f) *Certification and filing of deposition.* (1) The officer shall annex to the deposition his certificate showing:

(i) Due administration of the oath by the officer to the witness before the commencement of his deposition;

(ii) The name of the person by whom the deposition was taken down, and whether, if not taken down by the officer, it was taken down in his presence;

(iii) The presence or absence of the adverse party:

(iv) The place, day, and hour of commencing and taking the deposition;

(v) The fact that the officer was not disqualified as specified in Rule 28 of the Federal Rules of Civil Procedure.

(2) If any of the foregoing requirements in paragraph (f)(1) are waived, the certificate shall so state. The officer shall sign the certificate and affix thereto his seal of office, if he has such a seal. Unless waived on the record by an agreement, he shall then securely seal in an envelope all the evidence, notices, and paper exhibits, inscribe upon the envelope a certificate giving the number and title of the case, the name of each witness, and the date of sealing. The officer or the party taking the deposition, or its attorney or other authorized representative, shall then address the package, and forward the same to the Commissioner of Patents and Trademarks. If the weight or bulk of an exhibit shall exclude it from the envelope, it shall, unless waived on the record by agreement of all parties, be authenticated by the officer and transmitted by the officer or the party taking the deposition, or its attorney or other authorized representative, in a separate package marked and addressed as provided in this section.

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14. Section 2.125 is amended by revising paragraph (c) to read as follows:

§2.125 Filing and service of testimony.

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(c) One certified transcript and exhibits shall be filed with the Trademark Trial and Appeal Board. Notice of such filing shall be served on each adverse party and a copy of each notice shall be filed with the Board.

*****

15. Section 2.127 is amended by revising paragraphs (a), (b), (d), (e)(1) and (f) to read as follows:

§2.127 Motions.

(a) Every motion shall be made in writing, shall contain a full statement of the grounds, and shall embody or be accompanied by a brief. Except as provided in paragraph (e)(1) of this section, a brief in response to a motion shall be filed within fifteen days from the date of service of the motion unless another time is specified by the Trademark Trial and Appeal Board or the time is extended by stipulation of the parties approved by the Board, or upon motion granted by the Board, or upon order of the Board. If a motion for an extension is denied, the time for responding to the motion may remain as specified under this section. The Board, may in its discretion, consider a reply brief. Except as provided in paragraph (e)(1) of this section, a reply brief, if filed, shall be filed within 15 days from the date of service of the brief in response to the motion. The time for filing a reply brief will not be extended. No further papers in support of or in opposition to a motion will be considered by the Board. Briefs shall be submitted in typewritten or printed form, double spaced, in at least pica or eleven-point type, on letter-size paper. The brief in support of the motion and the brief in response to the motion shall not exceed 25 pages in length; and a reply brief shall not exceed 10 pages in length. Exhibits submitted in support of or in opposition to the motion shall not be deemed to be part of the brief for purposes of determining the length of the brief. When a party fails to file a brief in response to a motion, the Board may treat the motion as conceded. An oral hearing will not be held on a motion except on order by the Board.

(b) Any request for reconsideration or modification of an order or decision issued on a motion must be filed within one month from the date thereof. A brief in response must be filed within 15 days from the date of service of the request.

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(d) When any party files a motion to dismiss, or a motion for judgment on the pleadings, or a motion for summary judgment, or any other motion which is potentially dispositive of a proceeding, the case will be suspended by the Trademark Trial and Appeal Board with respect to all matters not germane to the motion and no party should file any paper which is not germane to the motion except as otherwise specified in the Board's suspension order. If the case is not disposed of as a result of the motion, proceedings will be resumed pursuant to an order of the Board when the motion is decided.

(e)(1) A motion for summary judgment may not be filed until notification of the proceeding has been sent to the parties by the Trademark Trial and Appeal Board. A motion for summary judgment, if filed, should be filed prior to the commencement of the first testimony period, as originally set or as reset, and the Board, in its discretion, may deny as untimely any motion for summary judgment filed thereafter. A motion under Rule 56(f) of the Federal Rules of Civil Procedure, if filed in response to a motion for summary judgment, shall be filed within 30 days from the date of service of the summary judgment motion. The time for filing a motion under Rule 56(f) will not be extended. If no motion under Rule 56(f) is filed, a brief in response to the motion for summary judgment shall be filed within 30 days from the date of service of the motion unless the time is extended by stipulation of the parties approved by the Board, or upon motion granted by the Board, or upon order of the Board. If a motion for an extension is denied, the time for responding to the motion for summary judgment may remain as specified under this section. The Board may, in its discretion, consider a reply brief. A reply brief, if filed, shall be filed within 15 days from the date of service of the brief in response to the motion. The time for filing a reply brief will not be extended. No further papers in support of or in opposition to a motion for summary judgment will be considered by the Board.

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(f) The Board will not hold any person in contempt, or award attorneys' fees or other expenses to any party.

16. Section 2.134 is amended by revising paragraph (a) to read as follows:

§2.134 Surrender or voluntary cancellation of registration.

(a) After the commencement of a cancellation proceeding, if the respondent applies for cancellation of the involved registration under section 7(e) of the Act of 1946 without the written consent of every adverse party to the proceeding, judgment shall be entered against the respondent. The written consent of an adverse party may be signed by the adverse party or by the adverse party's attorney or other authorized representative.

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17. Section 2.146 is amended by revising paragraph (e)(1) to read as follows:

§2.146 Petitions to the Commissioner.

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(e)(1) A petition from the grant or denial of a request for an extension of time to file a notice of opposition shall be filed within fifteen days from the date of mailing of the grant or denial of the request. A petition from the grant of a request shall be served on the attorney or other authorized representative of the potential opposer, if any, or on the potential opposer. A petition from the denial of a request shall be served on the attorney or other authorized representative of the applicant, if any, or on the applicant. Proof of service of the petition shall be made as provided by §2.119(a). The potential opposer or the applicant, as the case may be, may file a response within fifteen days from the date of service of the petition and shall serve a copy of the response on the petitioner, with proof of service as provided by §2.119(a). No further paper relating to the petition shall be filed.

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PART 3 — RULES OF PRACTICE IN TRADEMARK CASES

18. The authority citation for part 3 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

19. Section 3.41 is revised to read as follows:

§3.41 Recording fees.

All requests to record documents must be accompanied by the appropriate fee. A fee is required for each application, patent and registration against which the document is recorded as identified in the cover sheet. The recording fee is set in §1.21(h) of this chapter for patents and in §2.6(b)(6) of this chapter for trademarks.

August 27, 1998 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Errata

"All reference to Patent No. 5,780,506 to Herbert Bayer, et. al., of Germany, for PHENYLACETIC ACID DERIVATIVES, AND USE AS FUNGICIDES appearing in the Official Gazette of July 14, 1998, should be deleted since no patent was granted."

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 1

RIN 0651-AA96

Revision of Patent Fees for Fiscal Year 1999; Correction

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final Rule; Correction.

SUMMARY: The Patent and Trademark Office published a document revising certain patent fee amounts for fiscal year 1999 in the *Federal Register* of July 24, 1998. Inadvertently, an incorrect fee amount was stated for a national stage fee in section 1.492(a)(5). This document corrects this national stage fee amount for fiscal year 1999.

EFFECTIVE DATE: October 1, 1998.

FOR FURTHER INFORMATION CONTACT: Matthew Lee by telephone at (703) 305-8051, fax at (703) 305-8007, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Office of Finance, Crystal Park 1, Suite 802, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The Patent and Trademark Office published a final rule entitled "Revision of Patent Fees for Fiscal Year 1999" in the *Federal Register* of July 24, 1998 (63 FR 39731). The final rule contains an error for a national stage fee in section 1.492(a)(5). The fee amount for fiscal year 1999 was incorrectly stated as $395.00 for a small entity, and $790.00 for other than a small entity. This correction revises this national stage fee amount.

In the "Revision of Patent Fees for Fiscal Year 1999" final rule that was published in the *Federal Register* of July 24, 1998 (63 FR 39731), make the following correction. On page 39734, in the third column, change the national stage fee amount for section 1.492(a)(5) to $345.00 for a small entity, and $690.00 for other than a small entity.

August 28, 1998 KENNETH R. CORSELLO
Associate Solicitor

DEPARTMENT OF COMMERCE

Patent and Trademark Office

[Docket No. 970129014-8206-02]

RIN 0651-XX09

Guidelines for the Examination of Claims Directed to Species of Chemical Compositions Based Upon a Single Prior Art Reference

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice.

SUMMARY: The Patent and Trademark Office (PTO) is publishing the final version of guidelines to be used by Office personnel in reviewing a certain type of patent application for compliance with 35 U.S.C. § 103. The guidelines are to be used when examining claims directed to a species or subgenus of chemical compositions when: (1) the claims have been rejected based upon a single prior art reference, and (2) the single prior art reference discloses a genus embracing the claimed species or subgenus but does not expressly describe the particular claimed species or subgenus. Because these guidelines govern internal practices, they are exempt from notice and comment rulemaking under 5 U.S.C. § 553(b)(A).

DATES: The guidelines are effective September 3, 1998.

FOR FURTHER INFORMATION CONTACT: Linda Moncys Isacson, Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 or Linda S. Therkorn, Box Comments, Assistant Commissioner for Patents, Washington, D.C. 20231, or by facsimile transmission to (703) 305-9373 or by electronic mail over the Internet to baird-comments@uspto.gov.

SUPPLEMENTAL INFORMATION:

Discussion of Public Comments:

Comments were received by the PTO from two different individuals and one organization in response to the Request for Comments on the Interim Guidelines for the Examination of Claims Directed to Species of Chemical Compositions Based Upon a Single Prior Art Reference published February 11, 1997 (62 FR 6217). All comments have been carefully considered.

The following comments have been substantively adopted to effect changes in the guidelines:

(1) A suggestion to annotate the flowchart with references to corresponding sections of text in the guidelines was adopted.

(2) One comment suggested that the guidelines inappropriately focussed solely on the number of possible members of a prior art genus to determine whether the prior art genus anticipated a claimed species or subgenus. Attention was drawn to the discussion of *In re Petering*, 301 F.2d 676, 133 USPQ 275 (CCPA 1962) in the text at section II.A.4.a and note 22, which seemed to suggest that size of the genus alone was sufficient

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to support a finding of anticipation. These portions of the guidelines have been modified to indicate that size of the genus is only one factor to be considered in determining anticipation.

(3) One comment suggested that the guidelines be supplemented to direct Office personnel to consider the sufficiency of the preparative methods disclosed in the cited reference. Failure of a prior art reference to disclose or render obvious a method for making any composition of matter may preclude a conclusion that the composition would have been obvious if the disclosure is not enabling. However, once a *prima facie* case of obviousness is made out by the PTO, the initial burden of going forward with evidence to show that no process was known in the art for preparing the compound is on the applicant. Accordingly, the guidelines have been changed at section II.B to include consideration of sufficiency of disclosure of preparative methods as rebuttal evidence to overcome a *prima facie* case of obviousness.

(4) One comment suggested that the language in section II.A.2 of the guidelines and in corresponding portions of the flowchart instructing Office personnel to make explicit findings on the similarities and differences between "the closest prior art reference" and the claimed species or subgenus be changed to direct findings to be made between the "closest disclosed species or subgenus" and the claimed species or subgenus for accuracy and clarity. This change has been made in the text.

(5) One comment suggested that section II.A.4.d be clarified to indicate that the utility disclosed in a reference need not be the same as the stated utility of the claimed compound. Language has been added to indicate that any useful property may be the basis of a finding of motivation.

(6) One comment suggested that language in section II.B. stating that evidence of an unexpected property may not be sufficient to overcome a *prima facie* case of obviousness, regardless of the scope of the showing, is not accurate in view of the law. Language has been added to the associated footnote to clarify that a showing of an unexpected property is sufficient in most circumstances.

The following comments have been considered but have not been adopted for the reasons discussed below:

(1) One comment suggested that more emphasis be placed on additional references which may teach away from the claimed compound(s) due to a disclosure of related compounds having or expected to have disadvantages not possessed by the claimed compound(s). This comment was not adopted because it focuses on "additional references," whereas the scope of these guidelines is directed to situations involving rejections over a single reference. The guidelines already clearly instruct Office personnel that they must consider any additional references or evidence of teaching away that are present.

(2) One comment suggested that the guidelines were too limited in scope because they focused on rejections based on a single reference as opposed to rejections based on more than one reference. The scope of these guidelines is intended to address a specific issue, i.e., the situation where only one reference disclosing a genus but not the claimed species is found. Although the principles discussed in these guidelines are generally applicable to all rejections under 35 U.S.C. § 103, the explicit scope of these guidelines will not be changed.

(3) One comment suggested that section II.A.4.f of the guidelines inappropriately instructs Office personnel to focus only on evidence supporting a rejection rather than making a complete analysis. Section II.A.4.f of the guidelines additionally instructs Office personnel to consider the totality of the evidence in each case. Furthermore, Office personnel are instructed in section II.B to consider whether rebuttal evidence overcomes a *prima facie* case of obviousness and in section III to reconsider all evidence in reaching a conclusion. Thus, the guidelines presently clearly require all evidence to be considered, not only evidence supporting a rejection.

(4) One comment suggested that the last sentence of section II.A.4.c assumes that a generic teaching in a reference, by itself, is never enough to make out a prima facie case of obviousness. The referenced language does not suggest this, but rather it merely states the general proposition that in most cases, additional teachings of structural similarity to the disclosed species or subgenus are necessary. Accordingly, no change has been made.

(5) One comment suggested that the guidelines address the significance of the type of reference involved, i.e. whether there is a difference between a journal publication, a U.S. Patent, a foreign patent, etc. This suggestion has not been adopted, because for substantive analysis under 35 U. S.C. § 103, each reference should be considered for all of its teachings, regardless of its form.

(6) One comment suggested that the guidelines address the significance of the presence or absence of any activity testing of disclosed species in the reference. The guidelines already instruct Office personnel to consider any teachings of similar properties or uses, predictability of the technology, and any other teachings present in the reference that would support selection of the claimed compound. Consideration of any disclosed testing data is subsumed in these considerations.

I. Guidelines for the Examination of Claims Directed to Species of Chemical Compositions Based Upon a Single Prior Art Reference

These "Genus-Species Guidelines" are to assist Office personnel in the examination of applications which contain claims to species or a subgenus of chemical compositions for compliance with 35 U.S.C. § 103 based upon a single prior art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus. Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious. Where such additional prior art is not found, Office personnel should follow these guidelines to determine whether a single reference 35 U.S.C. § 103 rejection would be appropriate. The guidelines are based on the Office's current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit, and the Federal Circuit's predecessor courts.

The analysis of the guidelines begins at the point during examination after a single prior art reference is found disclosing a genus encompassing the claimed species or subgenus. Before reaching this point, Office personnel should follow appropriate antecedent examination procedures. Accordingly, Office personnel should first analyze the claims as a whole in light of and consistent with the written description, considering all claim limitations.[1] Next, Office personnel should conduct a thorough search of the prior art and identify all relevant references.[2] If the most relevant prior art consists of a single prior art reference disclosing a genus encompassing the claimed species or subgenus, Office personnel should follow the guidelines set forth herein.

These guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law. Rather, they are to assist Office personnel in analyzing claimed subject matter for compliance with substantive law. Thus, rejections must be based upon the substantive law, and it is these rejections which are appealable, not any failure by Office personnel to follow these guidelines.

Office personnel are to rely on these guidelines in the event of any inconsistent treatment of issues between these guidelines and any earlier provided guidance from the Office.

II. Determine Whether the Claimed Species or Subgenus Would Have Been Obvious to One of Ordinary Skill in the Pertinent Art at the Time the Invention Was Made

The patentability of a claim to a specific compound or subgenus embraced by a prior art genus should be analyzed no differently than any other claim for purposes of 35 U.S.C. § 103.[3] A determination of patentability under 35 U.S.C. § 103 should be made upon the facts of the particular case in view of the totality of the circumstances.[4] Use of *per se* rules by

Office personnel is improper for determining whether claimed subject matter would have been obvious under 35 U.S.C. § 103.5 The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness.[6]

A proper obviousness analysis involves a three step process. First, Office personnel should establish a *prima facie* case of unpatentability considering the factors set out by the Supreme Court in *Graham v. John Deere*.[7] If a *prima facie* case is established, the burden shifts to applicant to come forward with rebuttal evidence or argument to overcome the *prima facie* case.[8] Finally, Office personnel should evaluate the totality of the facts and all of the evidence to determine whether they still support a conclusion that the claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made.[9]

A. Establishing a *Prima Facie* Case of Obviousness

To establish a *prima facie* case of obviousness in a genus-species chemical composition situation, as in any other 35 U.S.C. § 103 case, it is essential that Office personnel find some motivation or suggestion to make the claimed invention in light of the prior art teachings.[10] In order to find such motivation or suggestion there should be a reasonable likelihood that the claimed invention would have the properties disclosed by the prior art teachings.[11] These disclosed findings should be made with a complete understanding of the first three "Graham factors."[12] Thus, Office personnel should (1) determine the "scope and content of the prior art"; (2) ascertain the "differences between the prior art and the claims at issue"; and (3) determine "the level of ordinary skill in the pertinent art."[13]

1. Determine The Scope and Content of the Prior Art

As an initial matter, Office personnel should determine the scope and content of the relevant prior art. Each reference must qualify as prior art under 35 U.S.C. § 102,[14] and should be in the field of applicant's endeavor, or be reasonably pertinent to the particular problem with which the inventor was concerned.[15]

In the case of a prior art reference disclosing a genus, Office personnel should make findings as to (1) the structure of the disclosed prior art genus and that of any expressly described species or subgenus within the genus; (2) any physical or chemical properties and utilities disclosed for the genus, as well as any suggested limitations on the usefulness of the genus, and any problems alleged to be addressed by the genus; (3) the predictability of the technology; and (4) the number of species encompassed by the genus taking into consideration all of the variables possible.

2. Ascertain The Differences Between the Closest Disclosed Prior Art Species or Subgenus of Record and the Claimed Species or Subgenus

Once the structure of the disclosed prior art genus and that of any expressly described species or subgenus within the genus are identified, Office personnel should compare it to the claimed species or subgenus to determine the differences. Through this comparison, the closest disclosed species or subgenus in the prior art reference should be identified and compared to that claimed. Office personnel should make explicit findings on the similarities and differences between the closest disclosed prior art species or subgenus of record and the claimed species or subgenus including findings relating to similarity of structure, chemical properties and utilities. [16]

3. Determine the Level of Skill in the Art

Office personnel should evaluate the prior art from the standpoint of the hypothetical person having ordinary skill in the art at the time the claimed invention was made.[17] In most cases, the only facts of record pertaining to the level of skill in the art will be found within the prior art reference. However, any additional evidence presented by applicant should be evaluated.

4. Determine Whether One of Ordinary Skill in the Art Would Have Been Motivated to Select the Claimed Species or Subgenus

In light of the findings made relating to the three *Graham* factors, Office personnel should determine whether one of ordinary skill in the relevant art would have been motivated to make the claimed invention as a whole, *i.e.*, to select the claimed species or subgenus from the disclosed prior art genus.[18] To address this key issue, Office personnel should consider all relevant prior art teachings, focusing on the following, where present.

a. Consider the Size of the Genus

Consider the size of the prior art genus, bearing in mind that size alone cannot support an obviousness rejection.[19] There is no absolute correlation between the size of the prior art genus and a conclusion of obviousness.[20] Thus, the mere fact that a prior art genus contains a small number of members does not create a *per se* rule of obviousness. Some motivation to select the claimed species or subgenus must be taught by the prior art.[21] However, a genus may be so small that, when considered in light of the totality of the circumstances, it would anticipate the claimed species or subgenus. For example, it has been held that a prior art genus containing only 20 compounds and a limited number of variations in the generic chemical formula inherently anticipated a claimed species within the genus because "one skilled in [the] art would . . . envisage *each member*" of the genus.[22]

b. Consider the Express Teachings

If the prior art reference expressly teaches a particular reason to select the claimed species or subgenus, Office personnel should point out the express disclosure which would have motivated one of ordinary skill in the art to select the claimed invention.[23]

c. Consider the Teachings of Structural Similarity

Consider any teachings of a "typical," "preferred," or "optimum" species or subgenus within the disclosed genus. If such a species or subgenus is structurally similar to that claimed, its disclosure may motivate one of ordinary skill in the art to choose the claimed species or subgenus from the genus,[24] based on the reasonable expectation that structurally similar species usually have similar properties.[25] The utility of such properties will normally provide some motivation to make the claimed species or subgenus.[26]

In making an obviousness determination, Office personnel should consider the number of variables which must be selected or modified, and the nature and significance of the differences between the prior art and the claimed invention.[27] The closer the physical and chemical similarities between the claimed species or subgenus and any exemplary species or subgenus disclosed in the prior art, the greater the expectation that the claimed subject matter will function in an equivalent manner to the genus.[28]

Similarly, consider any teaching or suggestion in the reference of a preferred species or subgenus that is significantly different in structure from the claimed species or subgenus. Such a teaching may weigh against selecting the claimed species or subgenus and thus against a determination of obviousness.[29] For example, teachings of preferred species of a complex nature within a disclosed genus may motivate an artisan of ordinary skill to make similar complex species and thus teach away from making simple species within the genus.[30] Concepts used to analyze the structural similarity of chemical compounds in other types of chemical cases are equally useful in analyzing genus-species cases.[31] Generally, some teaching of a structural similarity will be necessary to suggest selection of the claimed species or subgenus.[32]

d. Consider the Teachings of Similar Properties or Uses

Consider the properties and utilities of the structurally similar prior art species or subgenus. It is the properties and utilities that provide real world motivation for a person of ordinary skill to make species structurally similar to those in the prior art.[33] Conversely, lack of any known useful properties weighs against a finding of motivation to make or select a species or subgenus.[34] However, the prior art need not disclose a newly

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discovered property in order for there to be a *prima facie* case of obviousness.[35] If the claimed invention and the structurally similar prior art species share any useful property, that will generally be sufficient to motivate an artisan of ordinary skill to make the claimed species.[36] For example, based on a finding that a tri-ortho ester and a tetra-ortho ester behave similarly in certain chemical reactions, it has been held that one of ordinary skill in the relevant art would have been motivated to select either structure.[37] In fact, similar properties may normally be presumed when compounds are very close in structure.[38] Thus, evidence of similar properties or evidence of any useful properties disclosed in the prior art that would be expected to be shared by the claimed invention weighs in favor of a conclusion that the claimed invention would have been obvious.[39]

e. Consider the Predictability of the Technology

Consider the predictability of the technology.[40] If the technology is unpredictable, it is less likely that structurally similar species will render a claimed species obvious because it may not be reasonable to infer that they would share similar properties.[41] However, obviousness does not require absolute predictability, only a reasonable expectation of success, *i.e.*, a reasonable expectation of obtaining similar properties.[42]

f. Consider Any Other Teaching to Support the Selection of the Species or Subgenus

The categories of relevant teachings enumerated above are those most frequently encountered in a genus-species case, but they are not exclusive. Office personnel should consider the totality of the evidence in each case. In unusual cases, there may be other relevant teachings sufficient to support the selection of the species or subgenus and, therefore, a conclusion of obviousness.

5. Make Express Fact-Findings And Determine Whether They Support A *Prima Facie* Case of Obviousness

Based on the evidence as a whole,[43] Office personnel should make express fact-findings relating to the *Graham* factors, focusing primarily on the prior art teachings discussed above. The fact-findings should specifically articulate what teachings or suggestions in the prior art would have motivated one of ordinary skill in the art to select the claimed species or subgenus.[44] Thereafter, it should be determined whether these findings, considered as a whole, support a *prima facie* case that the claimed invention would have been obvious to one of ordinary skill in the relevant art at the time the invention was made.

B. Determining Whether Rebuttal Evidence Is Sufficient To Overcome the *Prima Facie* Case of Obviousness

If a *prima facie* case of obviousness is established, the burden shifts to the applicant to come forward with arguments and/or evidence to rebut the *prima facie* case.[45] Rebuttal evidence and arguments can be presented in the specification,[46] by counsel,[47] or by way of an affidavit or declaration under 37 CFR § 1.132.[48] However, arguments of counsel cannot take the place of factually supported objective evidence.[49]

Office personnel should consider all rebuttal arguments and evidence presented by applicants.[50] Rebuttal evidence may include evidence of "secondary considerations," such as "commercial success, long felt but unsolved needs, [and] failure of others,"[51] evidence that the claimed invention yields unexpectedly improved properties or properties not present in the prior art,[52] or evidence that the claimed invention was copied by others.[53] It may also include evidence of the state of the art, the level of skill in the art, and the beliefs of those skilled in the art.[54] For example, rebuttal evidence may include a showing that the prior art fails to disclose or render obvious a method for making the compound, which would preclude a conclusion of obviousness of the compound.[55]

Consideration of rebuttal evidence and arguments requires Office personnel to weigh the proffered evidence and arguments. Office personnel should avoid giving evidence no weight, except in rare circumstances.[56] However, to be entitled to substantial weight, the applicant should establish a nexus between the rebuttal evidence and the claimed invention,[57] *i.e.*, objective evidence of nonobviousness must be attributable to the claimed invention.[58] Additionally, the evidence must be reasonably commensurate in scope with the claimed invention.[59] However, an exemplary showing may be sufficient to establish a reasonable correlation between the showing and the entire scope of the claim, when viewed by a skilled artisan.[60] On the other hand, evidence of an unexpected property may not be sufficient regardless of the scope of the showing.[61] Accordingly, each case should be evaluated individually based on the totality of the circumstances.

Office personnel should not evaluate rebuttal evidence for its "knockdown" value against the *prima facie* case[62] or summarily dismiss it as not compelling or insufficient. If the evidence is deemed insufficient to rebut the *prima facie* case of obviousness, Office personnel should specifically set forth the facts and reasoning that justify this conclusion.

III. Reconsider All Evidence and Clearly Communicate Findings and Conclusions

A determination under 35 U.S.C. § 103 should rest on all the evidence and should not be influenced by any earlier conclusion.[63] Thus, once the applicant has presented rebuttal evidence, Office personnel should reconsider any initial obviousness determination in view of the entire record.[64] All the proposed rejections and their bases should be reviewed to confirm their correctness. Only then should any rejection be imposed in an Office action. The Office action should clearly communicate the Office's findings and conclusions, articulating how the conclusions are supported by the findings.

Where applicable, the findings should clearly articulate which portions of the reference support any rejection. Explicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. § 103 ground of rejection.[65] Conclusory statements of similarity or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings.

VI. Endnotes

1. When evaluating the scope of a claim, every limitation in the claim must be considered. *E.g., In re Ochiai*, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995). However, the claimed invention may not be dissected into discrete elements to be analyzed in isolation, but must be considered as a whole. *E.g., W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *Jones v. Hardy*, 727 F.2d 1524, 1530, 220 USPQ 1021, 1026 (Fed. Cir. 1983) ("treating the advantage as the invention disregards the statutory requirement that the invention be viewed 'as a whole'").

2. Both claimed and unclaimed aspects of the invention should be searched if there is a reasonable expectation that the unclaimed aspects may be later claimed.

3. "The section 103 requirement of unobviousness is no different in chemical cases than with respect to other categories of patentable inventions." *In re Papesch*, 315 F.2d 381, 385, 137 USPQ 43, 47 (CCPA 1963).

4. *E.g., In re Dillon*, 919 F.2d 688, 692-93, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990)(in banc).

5. *E.g., In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1996); *In re Ochiai*, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995); *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994).

6. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (Federal Circuit has "decline[d] to extract from *Merck [& Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)] the rule that . . . regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to

fall within it."). *See also In re Deuel*, 51 F.3d 1552, 1559, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995).

7. *E.g., In re Bell*, 991 F.2d 781,783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) ("The PTO bears the burden of establishing a case of *prima facie* obviousness."); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966), requires that to make out a case of obviousness, one must: (1) determine the scope and contents of the prior art; (2) ascertain the differences between the prior art and the claims in issue; (3) determine the level of skill in the pertinent art; and (4) evaluate any evidence of secondary considerations.

8. *E.g., Bell*, 991 F.2d at 783-84, 26 USPQ2d at 1531; *Rijckaert*, 9 F.3d at 1532, 28 USPQ2d at 1956; *Oetiker*, 977 F.2d at 1445, 24 USPQ2d at 1444.

9. *Id.*

10. *E.g., In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1996) ("[T]he mere possibility that one of the esters or the active methylene group-containing compounds . . . could be modified or replaced such that its use would lead to the specific sulfoalkylated resin recited in claim 8 does not make the process recited in claim 8 obvious 'unless the prior art suggested the desirability of [such a] modification' or replacement.") (quoting *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984); *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) ("[A] proper analysis under § 103 requires, *inter alia*, consideration of . . . whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process.").

11. The prior art disclosure may be express, implicit, or inherent. Regardless of the type of disclosure, the prior art must provide some motivation to one of ordinary skill in the art to make the claimed invention in order to support a conclusion of obviousness. *E.g., Vaeck*, 947 F.2d at 493, 20 USPQ2d at 1442 (A proper obviousness analysis requires consideration of "whether the prior art would also have revealed that in so making or carrying out [the claimed invention], those of ordinary skill would have a reasonable expectation of success."); *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art."); *Hodosh v. Block Drug Co.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

12. When evidence of secondary considerations such as unexpected results is initially before the Office, for example in the specification, that evidence should be considered in deciding whether there is a *prima facie* case of obviousness. The determination as to whether a *prima facie* case exists should be made on the full record before the Office at the time of the determination.

13. *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). *Accord, e.g., In re Paulsen*, 30 F.3d 1475, 1482, 31 USPQ2d 1671, 1676 (Fed. Cir. 1994).

14. *E.g., Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987) ("Before answering *Graham's* 'content' inquiry, it must be known whether a patent or publication is in the prior art under 35 U.S.C. § 102.").

15. *In re Oetiker*, 977 F.2d 1443, 1447, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). *Accord, e.g., In re Clay*, 966 F.2d 656, 658-59, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992).

16. In *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537, 218 USPQ 871,877 (Fed. Cir. 1983), the Court noted that "the question under 35 U.S.C. § 103 is not whether the differences [between the claimed invention and the prior art] would have been obvious" but "whether the claimed invention *as a whole* would have been obvious." (emphasis in original).

17. *See, Ryko Manufacturing Co. v. Nu-Star Inc.*, 950 F.2d 714, 718, 21 USPQ2d 1053, 1057 (Fed. Cir. 1991)("The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry."); *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988) (evidence must be viewed from position of ordinary skill, not of an expert).

18. *E.g., Ochiai*, 71 F.3d at 1569-70, 37 USPQ2d at 1131; *Deuel*, 51 F.3d at 1557, 34 USPQ2d at 1214 ("[A] *prima facie* case of unpatentability requires that the teachings of the prior art suggest *the claimed compounds* to a person of ordinary skill in the art." (emphasis in original)); *Jones*, 958 F.2d at 351, 21 USPQ2d at 1943-44 (Fed. Cir. 1992); *Dillon*, 919 F.2d at 692, 16 USPQ2d at 1901; *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984) ("The prior art must provide one of ordinary skill in the art the motivation to make the proposed molecular modifications needed to arrive at the claimed compound."). *See also In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996) (discussing motivation to combine).

19. *See, e.g., Baird*, 16 F.3d at 383, 29 USPQ2d at 1552 (observing that "it is not the mere number of compounds in this limited class which is significant here but, rather, the total circumstances involved").

20. *Id.*

21. *See, e.g., Deuel*, 51 F.3d at 1558-59, 34 USPQ2d at 1215 ("No particular one of these DNAs can be obvious unless there is something in the prior art to lead to the particular DNA and indicate that it should be prepared."); *Baird*, 16 F.3d at 382-83, 29 USPQ2d at 1552; *Bell*, 991 F.2d at 784, 26 USPQ2d at 1531 ("Absent anything in the cited prior art suggesting which of the 10^{36} possible sequences suggested by Rinderknecht corresponds to the IGF gene, the PTO has not met its burden of establishing that the prior art would have suggested the claimed sequences.").

22. *In re Petering*, 301 F.2d 676, 681, 133 USPQ 275, 280 (CCPA 1962) (emphasis in original). More specifically, the court in *Petering* stated:

> A simple calculation will show that, excluding isomerism within certain of the R groups, the limited class we find in Karrer contains only 20 compounds. However, we wish to point out that it is not the mere number of compounds in this limited class which is significant here but, rather, the total circumstances involved, including such factors as the limited number of variations for R, only two alternatives for Y and Z, no alternatives for the other ring positions, and a large unchanging parent structural nucleus. *With these circumstances in mind*, it is our opinion that Karrer has described to those with ordinary skill in this art each of the various permutations here involved as fully as if he had drawn each structural formula or had written each name.

Id. (emphasis in original).

Accord In re Schaumann, 572 F.2d 312, 316, 197 USPQ 5, 9 (CCPA 1978) (prior art genus encompassing claimed species which disclosed preference for lower alkyl secondary amines and properties possessed by the claimed compound constituted description of claimed compound for purposes of 35 U.S.C. § 102(b)). *C.f., In re Ruschig*, 343 F.2d 965, 974, 145 USPQ 274, 282 (CCPA 1965) (Rejection of claimed compound in light of prior art genus based on *Petering* is not appropriate where the prior art does not disclose a small recognizable class of compounds with common properties.).

23. An express teaching may be based on a statement in the prior art reference such as an art recognized equivalence. For example, *see Merck & Co. v. Biocraft Labs.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989) (holding claims directed to diuretic compositions comprising a specific mixture of amilofide and hydrochlorothiazide were obvious over a prior art reference expressly teaching that amilofide was a pyrazi-

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noylguanidine which could be co-administered with potassium excreting diuretic agents, including hydrochlorothiazide which was a named example, to produce a diuretic with desirable sodium and potassium eliminating properties). *See also, In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1312 (Fed. Cir. 1996) (holding there is sufficient motivation to combine teachings of prior art to achieve claimed invention where one reference specifically refers to the other).

24. *E.g., Dillon*, 919 F.2d at 696, 16 USPQ2d at 1904. *See also Deuel*, 51 F.3d at 1558, 34 USPQ2d at 1214 ("Structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain new compounds. For example, a prior art compound may suggest its homologs because homologs often have similar properties and therefore chemists of ordinary skill would ordinarily contemplate making them to try to obtain compounds with improved properties.").

25. *E.g., Dillon*, 919 F.2d at 693, 16 USPQ2d at 1901.

26. *See id.*

27. *E.g., In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (reversing obviousness rejection of novel dicamba salt with acyclic structure over broad prior art genus encompassing claimed salt, where disclosed examples of genus were dissimilar in structure, lacking an ether linkage or being cyclic); *In re Susi*, 440 F.2d 442, 445, 169 USPQ 423, 425 (CCPA 1971) (the difference from the particularly preferred subgenus of the prior art was a hydroxyl group, a difference conceded by applicant "to be of little importance.").

In the area of biotechnology, an exemplified species may differ from a claimed species by a conservative substitution ("the replacement in a protein of one amino acid by another, chemically similar, amino acid . . . [which] is generally expected to lead to either no change or only a small change in the properties of the protein." Dictionary of Biochemistry and Molecular Biology 97 (John Wiley & Sons, 2d ed. 1989)). The effect of a conservative substitution on protein function depends on the nature of the substitution and its location in the chain. Although at some locations a conservative substitution may be benign, in some proteins only one amino acid is allowed at a given position. For example, the gain or loss of even one methyl group can destabilize the structure if close packing is required in the interior of domains. James Darnell et al., Molecular Cell Biology, 51 (2d ed. 1990).

28. *E.g., Dillon*, 919 F.2d at 696, 16 USPQ2d at 1904 (and cases cited therein). *C.f. Baird*, 16 F.3d at 382-83, 29 USPQ2d at 1552 (disclosure of dissimilar species can provide teaching away).

29. *Baird*, 16 F.3d at 382-83, 29 USPQ2d at 1552 (reversing obviousness rejection of species in view of large size of genus and disclosed "optimum" species which differed greatly from and were more complex than the claimed species); *Jones*, 958 F.2d at 350, 21 USPQ2d at 1943 (reversing obviousness rejection of novel dicamba salt with acyclic structure over broad prior art genus encompassing claimed salt, where disclosed examples of genus were dissimilar in structure, lacking an ether linkage or being cyclic).

30. *Baird*, 16 F.3d at 382, 29 USPQ2d at 1552. See also *Jones*, 958 F.2d at 350, 21 USPQ2d at 1943 (disclosed salts of genus held not sufficiently similar in structure to render claimed species *prima facie* obvious).

31. For example, a claimed tetra-orthoester fuel composition was held to be obvious in light of a prior art tri-orthoester fuel composition based on their structural and chemical similarity and similar use as fuel additives. *Dillon*, 919 F.2d at 692-93, 16 USPQ2d at 1900-02.

Likewise, claims to amitriptyline used as an antidepressant were held obvious in light of the structural similarity to imipramine, a known antidepressant prior art compound, where both compounds were tricyclic dibenzo compounds and differed structurally only in the replacement of the unsaturated carbon atom in the center ring of amitriptyline with a nitrogen atom in imipramine. *In re Merck & Co.*, 800 F.2d 1091, 1096-97, 231 USPQ 375, 378-79 (Fed. Cir. 1986).

Other structural similarities have been found to support a *prima facie* case of obviousness. *E.g., In re May*, 574 F.2d 1082, 1093-95, 197 USPQ 601, 610-11 (CCPA 1978) (stereoisomers); *In re Wilder*, 563 F.2d 457, 460, 195 USPQ 426, 429 (CCPA1977) (adjacent homologs and structural isomers); *In re Hoch*, 428 F.2d 1341, 1344, 166 USPQ 406, 409 (CCPA 1970) (acid and ethyl ester); *In re Druey*, 319 F.2d 237, 240, 138 USPQ 39, 41 (CCPA 1963)(omission of methyl group from pyrazole ring).

32. *Id.*

33. *Dillon*, 919 F.2d at 697, 16 USPQ2d at 1905; *In re Stemniski*, 444 F.2d 581, 586, 170 USPQ 343, 348 (CCPA 1971).

34. *In re Albrecht*, 514 F.2d 1389, 1392, 1395-96, 185 USPQ 585, 587, 590 (CCPA 1975) (The prior art compound so irritated the skin that it could not be regarded as useful for the disclosed anesthetic purpose, and therefore a person skilled in the art would not have been motivated to make related compounds.); *Stemniski, 444 F.2d at 586, 170 USPQ at 348 (close structural similarity alone is not sufficient to create a prima facie* case of obviousness when the reference compounds lack utility, and thus there is no motivation to make related compounds.).

35. *Dillon*, 919 F.2d at 697, 16 USPQ2d at 1904-05 (and cases cited therein).

36. *E.g., id.*

37. *Id.* at 692, 16 USPQ2d at 1900-01.

38. *Dillon*, 919 F.2d at 693, 696, 16 USPQ2d at 1901, 1904. See also *In re Grabiak*, 769 F.2d 729, 731, 226 USPQ 870, 871 (Fed. Cir. 1985) ("When chemical compounds have 'very close' structural similarities and similar utilities, without more a *prima facie* case may be made.").

39. *Dillon*, 919 F.2d at 697-98, 16 USPQ2d at 1905; *In re Wilder*, 563 F.2d 457, 461,195 USPQ 426, 430 (CCPA 1977); *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

40. *See, e.g., Dillon*, 919 F. 2d at 692-97, 16 USPQ2d at 1901-05; *In re Grabiak*, 769 F.2d 729, 732-33,226 USPQ 870, 872 (Fed. Cir. 1985).

41. *See e.g., In re May*, 574 F.2d 1082, 1094, 197 USPQ 601, 611 (CCPA 1978) (*prima facie* obviousness of claimed analgesic compound based on structurally similar prior art isomer was rebutted with evidence demonstrating that analgesia and addiction properties could not be reliably predicted on the basis of chemical structure); *In re Schechter*, 205 F.2d 185, 191, 98 USPQ 144, 150 (CCPA 1953) (unpredictability in the insecticide field, with homologs, isomers and analogs of known effective insecticides having proven ineffective as insecticides, was considered as a factor weighing against a conclusion of obviousness of the claimed compounds).

42. *See, e.g., In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

43. *In re Bell*, 991 F.2d 781, 784, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993); *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1057 (Fed. Cir. 1990).

44. *Kulling*, 897 F.2d at 1149, 14 USPQ2d at 1058; *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1579 n.42, 1 USPQ2d 1593, 1606 n.42 (Fed. Cir. 1987).

45. *E.g., Dillon*, 919 F.2d at 692, 16 USPQ2d at 1901.

46. *In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995).

47. *In re Chu*, 66 F.3d 292, 299, 36 USPQ2d 1089, 1094-95 (Fed. Cir. 1995).

48. *E.g., Soni*, 54 F.3d at 750, 34 USPQ2d at 1687; *In re Piasecki*, 745 F.2d 1468, 1474, 223 USPQ 785, 789-90 (Fed. Cir. 1984).

49. *E.g., In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984).

50. *E.g., In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995) (error not to consider evidence presented in the specification). *C.f., In re Alton*, 76 F.3d 1168, 37 USPQ2d 1578 (Fed. Cir. 1996) (error not to consider factual evidence submitted to counter a section 112 rejection); *In re Beattie*, 974 F.2d 1309, 1313, 24 USPQ2d 1040, 1042-43 (Fed. Cir. 1992) (Office personnel should consider declarations from those skilled in the art praising the claimed invention and opining that the art teaches away from the invention.); *Piasecki*, 745 F.2d at 1472, 223 USPQ at 788 ("[Rebuttal evidence] may relate to any of the *Graham* factors including the so-called secondary considerations.").

51. *Graham v. John Deere Co.*, 383 U.S. at 17, 148 USPQ at 467. *See also, e.g., In re Piasecki*, 745 F.2d 1468, 1473, 223 USPQ 785, 788 (Fed. Cir. 1984) (commercial success).

52. Rebuttal evidence may consist of a showing that the claimed compound possesses unexpected properties. *Dillon*, 919 F.2d at 692-93, 16 USPQ2d at 1901. A showing of unexpected results must be based on evidence, not argument or speculation. *In re Mayne*, 104 F.3d 1339, 1343-44, 41 USPQ2d 1451, 1455-56 (Fed. Cir. 1997) (conclusory statements that claimed compound possesses unusually low immune response or unexpected biological activity that is unsupported by comparative data held insufficient to overcome prima facie case of obviousness).

53. *E.g., In re GPAC*, 57 F.3d 1573, 1580, 35 USPQ2d 1116, 1121 (Fed. Cir. 1995); *Hybritech Inc. v. Monoclonal Antibodies*, 802 F.2d 1367, 1380, 231 USPQ 81, 90 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987).

54. *E.g., In re Oelrich*, 579 F.2d 86, 91-92, 198 USPQ 210, 214 (CCPA 1978) (Expert opinions regarding the level of skill in the art were probative of the nonobviousness of the claimed invention.); *Piasecki*, 745 F.2d at 1471, 1473-74, 223 USPQ at 790 (Evidence of non-technological nature is pertinent to the conclusion of obviousness. The declarations of those skilled in the art regarding the need for the invention and its reception by the art were improperly discounted by the Board); *Beattie*, 974 F.2d at 1313, 24 USPQ2d at 1042-43 (Seven declarations provided by music teachers opining that the art teaches away from the claimed invention must be considered, but were not probative because they did not contain facts and did not deal with the specific prior art that was the subject of the rejection.).

55. A conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention. The court in *In re Hoeksema*, 399 F.2d 269, 274, 158 USPQ 596, 601 (CCPA 1968), stated:

> Thus, upon careful reconsideration it is our view that if the prior art of record fails to disclose or render obvious a method for making a claimed compound, at the time the invention was made, it may not be legally concluded that the compound itself is in the possession of the public. [footnote omitted.] In this context, we say that the absence of a known or obvious process for making the claimed compounds overcomes a presumption that the compounds are obvious, based on close relationships between their structures and those of prior art compounds.

The *Hoeksema* court further noted that once a *prima facie* case of obviousness is made by the PTO through citation of references, the burden is on the applicant to produce contrary evidence establishing that the reference being relied on would not enable a skilled artisan to produce the different compounds claimed. *Id.* at 274-75, 158 USPQ at 601. *See also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 295, 297, 227 USPQ 657, 666, 667 (Fed. Cir. 1985) (citing *Hoeksema* for the proposition above); *In re Grose*, 592 F.2d 1161, 1168, 201 USPQ 57, 63-64 (CCPA 1979) ("One of the assumptions underlying a prima facie obviousness rejection based upon a structural relationship between compounds, such as adjacent homologs, is that a method disclosed for producing one would provide those skilled in the art with a method for producing the other . . . Failure of the prior art to disclose or render obvious a method for making any composition of matter, whether a compound or a mixture of compounds like a zeolite, precludes a conclusion that the composition would have been obvious.")

56. *Id. See also In re Alton*, 76 F.3d 1168, 1174-75, 37 USPQ2d 1578, 1582-83 (Fed. Cir. 1996).

57. The Federal Circuit has acknowledged that applicant bears the burden of establishing nexus, stating:

> In the ex parte process of examining a patent application, however, the PTO lacks the means or resources to gather evidence which supports or refutes the applicant's assertion that the sales constitute commercial success. C.f. Ex parte Remark, 15 USPQ2d 1498, 1503 ([BPAI] 1990) (evidentiary routine of shifting burdens in civil proceedings inappropriate in ex parte prosecution proceedings because examiner has no available means for adducing evidence). Consequently, the PTO must rely upon the applicant to provide hard evidence of commercial success.

In re Huang, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996). *See also GPAC*, 57 F.3d at 1580, 35 USPQ2d at 1121; *In re Paulsen*, 30 F.3d 1475, 1482, 31 USPQ2d 1671, 1676 (Fed. Cir. 1994).

58. *E.g., Paulsen*, 30 F.3d at 1482, 31 USPQ2d at 1676. (Evidence of commercial success of articles not covered by the claims subject to the 35 U.S.C. § 103 rejection was not probative of nonobviousness).

59. *E.g., In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1058 (Fed. Cir. 1990); *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 777 (Fed. Cir. 1983). *In re Soni*, 54 F.3d 746, 34 USPQ2d 1684 (Fed. Cir. 1995) does not change this analysis. *In Soni*, the Court declined to consider the Office's argument that the evidence of non-obviousness was not commensurate in scope with the claim because it had not been raised by the Examiner. 54 F.3d at 751, 34 USPQ2d at 1688.

When considering whether proffered evidence is commensurate in scope with the claimed invention, Office personnel should not require the applicant to show unexpected results over the entire range of properties possessed by a chemical compound or composition. *E.g., In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987). Evidence that the compound or composition possesses superior and unexpected properties in one of a spectrum of common properties can be sufficient to rebut a *prima facie* case of obviousness. *Id.*

For example, a showing of unexpected results for a single member of a claimed subgenus,or a narrow portion of a claimed range would be sufficient to rebut a *prima facie* case of obviousness if a skilled artisan "could ascertain a trend in the exemplified data that would allow him to reasonably extend the probative value thereof." *In re Clemens*, 622 F.2d 1029, 1036, 206 USPQ 289, 296 (CCPA 1980) (Evidence of the unobviousness of a broad range can be proven by a narrower range when one skilled in the art could ascertain a trend that would allow him to reasonably extend the probative value thereof.). *But see, Grasselli*, 713 F.2d at 743, 218 USPQ at 778 (evidence of superior properties for sodium containing composition insufficient to establish the non-obviousness of broad claims for acatalyst with "an alkali metal" where it was well known in the catalyst art that different alkali metals were not interchangeable and applicant had shown unexpected results only for sodium containing materials); *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227,230 (CCPA 1978) (evidence of superior properties in one species insufficient to establish the nonobviousness of a subgenus containing hundreds of compounds); *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972) (one test not sufficient where there was no adequate basis for concluding the other claimed compounds would behave the sameway).

60. *E.g., Chupp*, 816 F.2d at 646, 2 USPQ2d at 1439; *Clemens*, 622 F.2d at 1036, 206 USPQ at 296.

61. Usually, a showing of unexpected results is sufficient to overcome a prima facie case of obviousness. *See, e.g., In re*

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Albrecht, 514 F.2d 1389, 1396, 185 USPQ 585, 590 (CCPA 1975). However, where the claims are not limited to a particular use, and where the prior art provides other motivation to select a particular species or subgenus, a showing of a new use may not be sufficient to confer patentability. *See Dillon*, 919 F.2d at 692, 16 USPQ2d at 1900-01.

62. *Piasecki*, 745 F.2d at 1473, 223 USPQ at 788.

63. *E.g., Piasecki*, 745 F.2d at 1472-73, 223 USPQ at 788; *In re Eli Lilly & Co.*, 902 F.2d 943,945, 14 USPQ2d 1741, 1743 (Fed. Cir. 1990).

64. *E.g., Piasecki*, 745 F.2d at 1472, 223 USPQ at 788; *Eli Lilly*, 902 F.2d at 945, 14 USPQ2d at 1743.

65. *Dillon*, 919 F.2d at 693, 16 USPQ2d at 1901; *In re Mills*, 916 F.2d 680, 683, 16 USPQ2d 1430, 1433 (Fed. Cir. 1990).

August 26, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Certificates of Correction for September 29, 1998

D. 380,965	5,662,200	5,715,541	5,745,907
D. 392,183	5,662,530	5,716,982	5,746,195
D. 394,663	5,663,127	5,717,502	5,747,796
D. 395,894	5,663,741	5,717,506	5,748,065
P. 9,657	5,665,339	5,717,640	5,748,363
Re. 35,782	5,665,582	5,717,680	5,748,645
5,227,017	5,665,593	5,717,700	5,748,810
5,274,257	5,666,239	5,718,316	5,748,869
5,288,772	5,672,536	5,718,658	5,748,901
5,357,600	5,672,780	5,718,949	5,748,935
5,361,391	5,673,155	5,720,091	5,749,955
5,376,566	5,674,740	5,720,808	5,749,990
5,382,343	5,675,700	5,721,122	5,750,190
5,395,714	5,676,390	5,721,226	5,750,224
5,406,513	5,677,311	5,722,534	5,750,347
5,407,621	5,679,475	5,723,127	5,750,714
5,426,144	5,680,486	5,725,338	5,750,968
5,434,701	5,682,195	5,726,872	5,752,022
5,439,689	5,685,510	5,727,965	5,752,941
5,466,691	5,686,088	5,728,310	5,753,139
5,475,173	5,686,352	5,728,776	5,753,408
5,482,853	5,686,504	5,729,384	5,753,512
5,506,970	5,686,532	5,729,940	5,753,773
5,507,717	5,687,845	5,730,908	5,756,405
5,508,457	5,688,742	5,731,035	5,756,424
5,550,429	5,689,006	5,731,293	5,756,567
5,552,448	5,689,217	5,731,732	5,757,003
5,571,799	5,689,429	5,732,049	5,757,461
5,571,852	5,691,177	5,732,067	5,758,352
5,574,206	5,692,041	5,732,125	5,758,518
5,595,970	5,693,663	5,733,306	5,758,794
5,604,776	5,695,287	5,733,339	5,758,973
5,605,545	5,696,793	5,734,021	5,759,599
5,606,471	5,699,158	5,734,336	5,759,780
5,610,271	5,699,794	5,734,340	5,759,797
5,611,775	5,700,933	5,735,329	5,760,426
5,612,278	5,701,371	5,736,430	5,760,473
5,621,888	5,701,568	5,736,879	5,760,894
5,622,521	5,701,721	5,737,387	5,761,009
5,627,913	5,704,967	5,737,547	5,761,410
5,635,434	5,705,203	5,739,216	5,761,704
5,638,748	5,706,352	5,740,808	5,762,105
5,647,188	5,708,913	5,742,144	5,762,374
5,647,259	5,709,923	5,742,373	5,762,418
5,647,304	5,710,093	5,742,744	5,762,985
5,648,442	5,711,293	5,742,928	5,763,280
5,649,029	5,711,328	5,743,331	5,763,659
5,653,774	5,712,159	5,743,733	5,764,407
5,654,145	5,712,680	5,743,987	5,765,040
5,654,841	5,713,138	5,745,353	5,765,241
5,658,140	5,713,924	5,745,513	5,765,260
5,658,755	5,714,049	5,745,833	5,766,385
5,766,442	5,771,268	5,776,815	5,783,755
5,766,637	5,771,729	5,778,560	5,784,809
5,767,116	5,772,385	5,780,329	5,785,328
5,767,154	5,773,279	5,780,664	5,785,717
5,767,325	5,773,363	5,780,785	5,786,184
5,767,634	5,773,535	5,781,157	5,786,213
5,768,291	5,773,558	5,781,239	5,786,323
5,768,643	5,773,865	5,781,788	5,788,745
5,768,843	5,774,739	5,782,121	5,788,889
5,770,138	5,775,146	5,782,642	5,789,951
5,770,338	5,775,339	5,782,833	5,789,964
5,770,606	5,776,278	5,783,161	
5,770,767	5,776,369	5,783,220	
5,771,203	5,776,665	5,783,697	

Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

August 10-14, 1998

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
8-10	EX	74/436,521	Klein Bicycle Corp.	2(d)	Refusal Affirmed		"PRIME" [high technology bicycle tire rims]	"PRIME AERO" (in stylized lettering) [bicycles and structural parts, namely, frames, brakes, chains, handlebars, saddles, gears, wheels, and gear shifters]	No
8-11	CANC (R) CANC (R)	21,309 21,321	Allied-Sysco Food Services, Inc. v. The Pizza Maker	abandonment	Request for Reconsideration Denied [Petitions to Cancel Granted]		"THE PIZZA MAKER" (and design) [franchising services, namely, offering technical assistance in the establishment and/or operation of pizza restaurants; restaurant services]; "THE PIZZA MAKER!" [pizza]		No
8-12	OPP	96,631	Conopco, Inc. v. Shangrila, Inc.	genericness; mere descriptiveness	Opposition Dismissed		"CERAMIDEA" [a complete line of nonmedicated skin care preparations]		No
8-13	EX	74/599,446	JB Oxford Holdings, Inc.	2(d)	Refusal Reversed		"JB OXFORD HOLDINGS" [securities brokerage services, namely, brokerage services at reduced prices featuring low commissions, flat rate commissions, and commission-free trading]	"OXFORD" (in stylized lettering) [investment management services, namely, investing the funds of others by purchasing stock in order to gain managing control of the acquired companies]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
8-13	EX	74/504,482	American Spirit Fashions, Inc.	2(d)	Refusal Affirmed		"YOU SPORT COLLECTION" (and design) [women's apparel, namely, dresses, tights, skirts, knit tops, blouses, pants, vests, jogging suits, tank tops, tunics, biking shorts, jackets, stretch body suits and leggings]	"YOU" (in stylized lettering) [hosiery, panties, slips, gowns, petticoats (half slips), bed jackets, camisoles, pajamas, and ensembles (namely, two pieces of lingerie comprising a gown and a negligee that can be sold separately or together as an ensemble), brassieres, foundations, girdles, garter belts, negligees, bandeaux, housecoats, lounging robes, lounging pajamas, beach robes, halters, and play shoes]	No
8-13	OPP (SJ)	93,593	Lotus Development Corp. v. Team Coordination Software, Inc.	2(d); counterclaim on grounds of abandonment	Opposition Dismissed; Counterclaim for cancellation granted (applicant's motion for summary judgment granted)	"AGENDA" [computer programs and program manuals sold as a unit]	"TEAMAGENDA" [computer software for maintaining personal and office calendars and business schedules]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
8-14	OPP	88,939	Zeneca Ltd. v. Saraya Co., Ltd.	2(d)	Opposition Sustained	"HIBICLENS" [antiseptics and disinfectants; antiseptic detergents for medical use incorporated in sponges and sponge brushes], "HIBISTAT" [antiseptics, bactericides, medicinal and personal disinfectants], and "HIBITANE" [antiseptics, bactericides, medicinal and personal disinfectants]	"HIBISCOHOL" [disinfectants for use on hands]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
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Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
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Box 10	Orders for certified copies of PTO documents.
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Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

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Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI[3]) in Sunnyvale, California.

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	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
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	New York Public Library (The Research Libraries)	(212) 592-7000
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	Toledo/Lucas County Public Library	(419) 259-5212
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PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director	308-0661	01/11/96
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	06/25/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	07/29/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	05/27/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	11/23/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	11/13/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	04/26/96
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-3900	04/26/96
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	12/21/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	11/12/96
TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director	305-3900	09/14/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	305-3293	06/28/96
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	12/14/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	03/11/97
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	02/07/96
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	02/13/96
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	02/04/97

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of August 1, 1998

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Christopher Wells, Acting Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/98	06/02/98
Law Office 102—Thomas Shaw, Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/26/97	03/30/98
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	11/26/97	03/30/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/20/97	05/22/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/05/97	03/05/98
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/22/98	05/22/98
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/16/98	06/01/98
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/23/97	04/17/98
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	10/21/97	06/03/98
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	05/19/98	—0—
Renewals (All Classes)	06/22/98	—0—
Section 12(c) Publications (All Classes)	05/26/98	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

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DEPARTMENT OF COMMERCE

Patent and Trademark Office
[Docket No. 980605148-8148-01]

Request for Comments on Interim Guidelines for Examination of Patent Applications Under the 35 U.S.C. § 112 ¶ 1 "Written Description" Requirement; Extension of Comment Period and Notice of Hearing

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice of hearings, extension of comment period and request for comments.

SUMMARY: The Patent and Trademark Office (PTO) will hold public hearings, and it requests comments, on issues relating to the "written description" requirement under 35 U.S.C. § 112 ¶ 1. Interested members of the public are invited to testify at public hearings and to present written comments on any of the topics outlined in the supplementary information section of this notice.

DATES: Public hearings will be held on Wednesday, November 4, 1998, and Friday, November 6, 1998, starting each day at 9:00 a.m. and ending no later than 5:00 p.m.

Those wishing to present oral testimony at either of the hearings must request an opportunity to do so no later than Friday, October 30. Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings no later than November 12, 1998.

To ensure consideration, written comments should be received at the PTO by November 12, 1998. Written comments and transcripts of the hearings will be available for public inspection on or about Monday, November 16, 1998.

ADDRESSES: The November 4th hearing will be held at the Marriott Long Wharf, Salons D, E, F, 296 State Street, Boston, MA 02109. Questions regarding the facilities and lodging should be directed to the Marriott Long Wharf, TEL (617) 227-0800, FAX (617) 227-2867.

The November 6th hearing will be held at The Sheraton San Diego Hotel & Marina, West Tower, Coronado Ballroom, 1590 Harbor Island Drive, San Diego, CA 92101-1092. Questions regarding the facilities and lodging should be directed to The Sheraton San Diego Hotel & Marina, West Tower, TEL (619) 291-2900, FAX (619) 692-2337.

Requests to testify should be sent to Mary Critharis by telephone at (703) 305-9300, by facsimile transmission at (703) 305-8885, or by mail marked to attention of Mary Critharis addressed to the Assistant Commissioner for Patents, Box 4, Washington, D.C. 20231.

No requests for oral testimony will be accepted through electronic mail.

Written comments should be addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Scott A. Chambers, Associate Solicitor, or to Box Comments, Assistant Commissioner for Patents, Washington, D.C. 20231, marked to the attention of Linda S. Therkorn. Comments may be submitted by facsimile transmission to Scott A. Chambers at (703) 305-9373, or to Linda S. Therkorn at (703) 305-8825. Comments may be submitted by electronic mail to scott.chambers@uspto.gov, or to linda.therkorn@uspto.gov.

Written comments and transcripts of the hearings will be maintained for public inspection in Suite 918 of Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.

Transcripts and comments provided in machine readable format will be available through anonymous file transfer protocol (ftp) via the Internet (address: comments.uspto.gov) and through the World Wide Web (address: www.uspto.gov).

FOR FURTHER INFORMATION CONTACT: Scott A. Chambers by telephone at (703) 305-9035, by facsimile transmission at (703) 305-9373, by mail to his attention addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, or by electronic mail at scott.chambers@uspto.gov; or Linda S. Therkorn by telephone at (703) 305-8800, by facsimile at (703) 305-8825, by mail to her attention addressed to Box Comments, Assistant Commissioner for Patents, Washington, D.C. 20231, or by electronic mail at linda.therkorn@uspto.gov.

SUPPLEMENTARY INFORMATION:

I. Background

Interim Guidelines for Examination of Patent Applications Under the 35 U.S.C. § 112 ¶ 1, "Written Description" Requirement were published at 63 FR 32639, June 15, 1998, and at 1212 O.G. 15, July 7, 1998. The period for comment on the Interim Guidelines was originally set to end September 14, 1998. The period for comment is now extended. Comments will be accepted by the PTO until November 12, 1998.

These guidelines are intended to assist examiners at the PTO in finding the attributes necessary to support the written description requirement of 35 U.S.C. § 112 ¶ 1, in view of *University of California v. Eli Lilly*, 119 F.3d 1559, 43 USPQ2d 1398 (Fed. Cir. 1997), and the earlier cases *Fiers v. Revel*, 984 F.2d 1164, 25 USPQ2d 1601 (Fed. Cir. 1993), and *Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991). The PTO endeavors to provide clear guidance to Office personnel in their task of administering the law so that consistent results are achieved. To ensure that examiners know when applicants have satisfied the requirements, the guidelines identify criteria supporting the determination that an application is in compliance with statutory requirements. The PTO invites the public to assist it in identifying the appropriate descriptive attributes that Office personnel should rely on in their determinations.

The PTO requests comments from any interested member of the public on the interim guidelines. Although the guidelines are directed primarily to written descriptions of biotechnological inventions, they reflect the current understanding of the PTO and apply across the board to all relevant technologies. Because these guidelines govern internal practices, they are exempt from notice and comment rulemaking under 5 U.S.C. § 553(b)(A).

II. Issues for Public Comment

Interested members of the public are invited to testify or to present written comments related to the written description requirement, including the following issues.

1. Is the methodology in the interim guidelines accurate? If not, please:
(a) identify any legal and/or technical inaccuracies;
(b) identify any changes to the guidelines that would improve their accuracy; and
(c) provide explanations and/or legal basis for your comments.

2. Do the guidelines list the appropriate relevant factors and descriptive attributes to consider in determining whether the written description requirement of 35 U.S.C. § 112 ¶ 1, is satisfied? If not, please:
(a) identify factors and descriptive attributes which have been omitted;
(b) identify any examples or parts of the analysis which are over inclusive; or

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(c) explain any changes which would improve the analysis.

3. Should the scope of these guidelines be limited to certain technologies? If so, please:

(a) identify the technologies that should be encompassed, and

(b) give reasons why the guidelines should not encompass other technologies generally.

4. Should the scope of these guidelines encompass all technologies? If so, please:

(a) state reasons why the guidelines should encompass technologies in addition to those discussed in the interim guidelines;

(b) give specific, factual examples that the guidelines should address, and how 35 U.S.C. § 112 ¶ 1, applies to the examples; and

(c) if these examples are subject to a rejection, how that rejection could be overcome.

5. How should "possession of the invention" be defined for purposes of applying the written description requirement?

6. How should the transition terms "having" and "consisting essentially of" be treated within the context of nucleotide and amino acid sequence claims?

7. How should the guidelines be expanded to specifically address process and/or product-by-process claims?

(a) Please suggest examples of process or product-by-process claims you want to see addressed in the guidelines, and how 35 U.S.C. § 112 ¶ 1, applies to the examples;

(b) suggest how the examples of process or product-by-process claims should be analyzed under the guidelines; and

(c) if these examples are subject to a rejection, how that rejection could be overcome.

8. How should the final guidelines address the deposit of a biological material made under 37 CFR § 1.801?

(a) Please suggest how the date of deposit should be considered with respect to establishing possession of the invention at the time of filing;

(b) suggest what significance should be assigned to a deposit in assessing compliance with the written description requirement; and

(c) comment on the extent to which a deposit of biological material may be relied on to support the addition of sequence information or the correction of sequence information in the originally filed application.

9. What impact will the guidelines have on issued patents, currently pending applications, or applications to be filed after publication of the final written description guidelines?

10. Is there any basis in law or fact for treating expressed sequence tags (ESTs) differently than any other nucleic acid under the written description requirement?

11. Are there additional issues related to other statutory requirements of Title 35 invoked in the patenting of ESTs? If so, please set forth those issues separately and specifically.

III. Guidelines for Oral Testimony

Individuals wishing to testify at the hearings must adhere to the following guidelines:

1. Requests to testify must include the speaker's name, affiliation, title, phone number, fax number, mailing address, and Internet mail address (if available).

2. Speakers will have between seven and fifteen minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. All efforts will be made to accommodate requests presented before the day of the hearing for additional time for testimony.

3. Requests to testify may be accepted on the date of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

A schedule providing approximate times for testimony will be provided to all speakers the morning of the day of the hearing.

Speakers are advised that the schedule for testimony may be subject to change during the course of the hearings.

IV. Guidelines for Written Comments

Written comments should include the following information:

1. Name and affiliation of the individual responding.

2. If applicable, an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views.

3. If applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization) and general areas of interest.

Information that is provided pursuant to this notice will be made part of the public record. In view of this, parties should not provide information they do not wish publicly disclosed. Parties who would like to rely on confidential information to illustrate a point being made
are requested to summarize or otherwise provide the information in a way that will permit its public disclosure.

Parties offering testimony or written comments should provide their comments in machine readable format, if possible. Such submissions should be provided by electronic mail messages over the Internet, or on a 3.5'' floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine readable submissions should be provided as unformatted text (e.g., ASCII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh, DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

V. Guidelines for Comments via Internet

Comments received via the Internet should include the same information requested in the guidelines set out for written comments.

September 16, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce
and Commissioner of Patents and Trademarks

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REEXAMINATIONS

SEPTEMBER 29, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,291,815 (3635th)

CERAMIC LID ASSEMBLY FOR HERMETIC SEALING OF A SEMICONDUCTOR CHIP

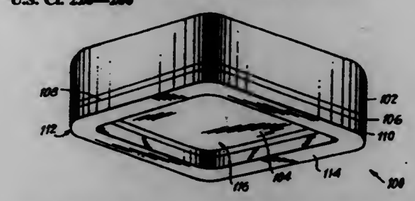
Richard Gordon, Scarsdale, and John G. Clabella, White Plains, both of N.Y., assignors to Semiconductor Packaging Materials Co., Inc.

Reexamination Request Nos. 90/004,713, Aug. 1, 1997 and 90/004,778, Oct. 1, 1997.

Reexamination Certificate for Patent 4,291,815, issued Sep. 29, 1981, Ser. No. 122,527, Feb. 19, 1980.

Int. Cl.[6] H01L *23/10;* **B65D** *6/40;39/00*

U.S. Cl. 220—200



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–10** are cancelled.

[1. A lid assembly for hermetic sealing of a package containing a semiconductor chip comprising: a lid of dielectric material including an integral heat fusible metallic layer deposited on said lid in a peripheral region defining a hermetic sealing area.]

B1 4,699,848 (3636th)

COMPOSITION OF ABRASION-RESISTANT MATERIAL FOR APPLICATION TO A SURFACE

Guy Maybon, Saint Jorioz, France, assignor to Technogenia S.A., Societe Anonyme, Saint Jorioz, France

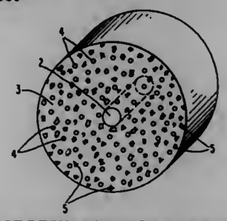
Reexamination Request No. 90/004,729, Aug. 22, 1997.

Reexamination Certificate for Patent 4,699,848, issued Oct. 13, 1987, Ser. No. 846,901, Apr. 1, 1986.

Claims priority, application France, Nov. 21, 1985, 85 17809

Int. Cl.[6] B22F *7/04;* **B23K** *35/40;* **B32B** *15/02*

U.S. Cl. 428—560



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. A product used for applying a coating of an abrasion-resistant material to a surface, by application of heat, the product including a continuous metallic core and a composition formed over said core, the composition comprising:

(a) a plurality of tungsten carbide particles,

(b) a plurality of particles of a nickel-based alloy, the alloy comprising, by weight, about 0.1–4% silicon, about 0.7–4% boron, about 0–16% chromium, the balance being nickel,

(c) an organic binder, in an amount, by weight, of about 0.5–1.5%, and

(d) a plasticizer,

the composition being formed in a substantially continuous length over the core, the product having sufficient flexibility to be wound on a spool.

B1 5,223,172 (3637th)

HARDENER FOR EPOXIDE RESIN MASSES

Joachim v. Seyerl, Seeon, and Horst Michaud, Trostberg, both of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

Reexamination Request No. 90/003,367, Mar. 24, 1994.

Reexamination Certificate for Patent 5,223,172, issued Jun. 29, 1993, Ser. No. 787,761, Nov. 6, 1991.

Continuation of Ser. No. 730,825, Jul. 12, 1991, abandoned, which is a continuation of Ser. No. 211,154, Jun. 22, 1988, abandoned, which is a continuation of Ser. No. 97,351, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 845,476, Mar. 27, 1986, abandoned, which is a continuation of Ser. No. 669,375, Nov. 8, 1984, abandoned.

Claims priority, application Germany, Nov. 11, 1983, 3340788

Int. Cl.[6] C08G *59/40;59/44*

U.S. Cl. 252—182.12

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7** are cancelled.

[1. A composition comprising:

a dispersion of a liquid epoxide resin with a dicyandiamide hardener distributed therein, said hardener consisting essentially of

a) dicyandiamide having a particle size distribution wherein at least 90% of the dicyandiamide particles are less than, or equal to, 10 microns; and

b) 0.1 to 30% by weight, referred to the weight of the dicyandiamide, of at least one oxide selected from the group consisting of silicon dioxide, calcium oxide, magnesium oxide, and zinc oxide.]

[3. The composition of claim 1 wherein the least one oxide has a specific surface area according to BET of at least 50 m^2/g.]

B1 5,252,149 (3638th)

FERROCHROMIUM ALLOY AND METHOD THEREOF

Kevin F. Dolman, Helena Valley, Australia, assignor to Warman International Ltd., Artarmon, Australia

Reexamination Request No. 90/004,427, Oct. 25, 1996.

Reexamination Certificate for Patent 5,252,149, issued Oct. 12, 1993, Ser. No. 15,878, Feb. 10, 1993.

Continuation of Ser. No. 671,885, Apr. 3, 1991, abandoned.

Claims priority, application Australia, Aug. 4, 1989, PJ5628

Int. Cl.[6] C22C *38/36;* **C21D** *6/00*

U.S. Cl. 148—605

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3–12** is confirmed.

Claims **1, 2** are cancelled.

New claims **13–88** are added and determiend to be patentable.

13. An erosion and corrosion resistant ferrochromium alloy comprising the following composition, in wt. %:

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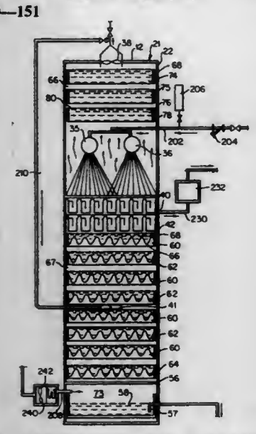
35.8–50 chromium
1.5–2.3 carbon
up to 5 managanese
up to 5 silicon
up to 5 molybdenum
up to 10 nickel
up to 5 copper
up to 1% of each of one or more micro-alloying elements selected from the group consisting of titanium, zirconium, niobium, boron, vanadium and tungsten, and balance, iron and incidental impurities, with a microstructure comprising eutectic chromium carbides in a matrix comprising one or more of ferrite, retained austenite and martensite, as herein defined.

B1 5,389,248 (3639th)
BIOREACTOR FOR BIOLOGICAL TREATMENT OF CONTAMINATED WATER
François Paré, Montreal, and John Hart, Fredericton, both of Canada, assignors to Tour McGill College, Montreal, Canada
Reexamination Reqnest No. 90/004,571, Feb. 25, 1997.
Reexamination Certificate for Patent 5,389,248, issued Feb. 14, 1995, Ser. No. 66,308, May 21, 1993.
Int. Cl.[6] C02F *3/10*
U.S. Cl. 210—151



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **11** is cancelled.

Claim **1** and **12** are determined to be patentable as amended.

Claims **2-10** and **13-16**, dependent on an amended claim, are determined to be patentable.

1. A bioreactor unit for the aerobic biological treatment of hydrocarbon contaminated waste water and off-gases, said bioreactor comprising a biotreatment chamber which comprises:

a vertically extending housing unit forming walls, floor and ceiling of said biotreatment chmber, said housing unit comprising a door for accessing said treatment chamber;

waste water inlet means for discharging waste water under pressure from an upper portion of said biotreatment chamber;

containment means for capturing precipitated metals in said waste water to be treated;

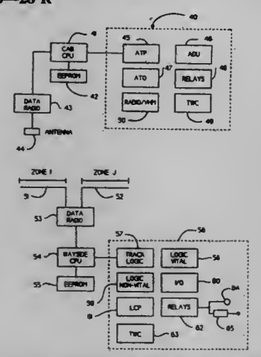
a plurality of superimposed water treatment trays disposed substantially horizontally in said housing of said biotreatment chamber and below said waste water inlet means, said water treatment trays being adapted for retrieval from said biotreatment chamber through said door of said housing unit, each of said water treatment trays having at least one bottom porous section containing an organic contact media, said organic contact media comprising naturally occurring organic vegetative matter, said organic contact media acting to retain and favor growth or microorganisms having the ability to degrade hydrocarbons in said waste water, said water treatment trays being disposed in said biotreatment chamber in a stationary relationship during treatment to permit intimate successive contact of said waste water with said organic contact media on each of said water treatment trays for gradual treatment of said waste water, as said waste water flows downwards in said biotreatment chamber;

water outlet means substantially at a botom of said biotreatment chamber for discharging treated waste water from said biotreatment chamber;

air flow means for creating an aerobic environment in said biotreatment chamber, said air flow means being adapted to provide air flow through said wate treatment trays in said biotreatment chamber; and

air outlet means for removing air introduced in said biotreatment chamber through said air flow means.

B1 5,398,894 (3640th)
VIRTUAL BLOCK CONTROL SYSTEM FOR RAILWAY VEHICLE
Robert D. Pascoe, Pittsburgh, Pa., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.
Reexamination Request No. 90/004,836, Nov. 13, 1997.
Reexamination Certificate for Patent 5,398,894, issued Mar. 21, 1995, Ser. No. 104,875, Aug. 10, 1993.
Int. Cl.[6] B61L *25/00*
U.S. Cl. 246—28 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **41**, **59** are cancelled.

Claims **1**, **15**, **22–23**, **40**, **42**, **44**, **55** and **58** are determined to be patentable as amended.

Claims **2–14**, **16–21**, **24–39**, **43**, **45–54**, **56–57** and **60–61**, dependent on an amended claim, are determined to be patentable.

New claims **62–63** are added and determined to be patentable.

1. An apparatus for control of a rail vehicle on a section of track having corresponding wayside interlocking equipment and carborne train operation equipment, such apparatus comprising:

receiving means for receiving data relating to the physical location of such rail vehicle within such zone;

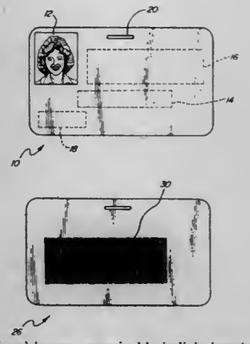
CPU means wayside for translating said location into occupancy signals representative of a plurality of virtual blocks within such zone;

means for sending said occupancy signals representative of said virtual blocks to such wayside interlocking equipment;

such wayside equipment having means for generating profile data *that is a function of the occupancy of said plurality of virtual blocks, said profile data being* indicative of the operation of such rail vehicle within such zone; and

wayside transmitter means for transmitting said profile data to said rail vehicle.

B1 5,505,494 (3641st)
SYSTEM FOR PRODUCING A PERSONAL ID CARD
Barry P. Belluci, Ann Arbor, and Eliot Charlip, West Bloomfield, both of Mich., assignors to Bell Data Software Corp., Ann Arbor, Mich.
Reexamination Request No. 90/004,918, Feb. 17, 1998.
Reexamination Certificate for Patent 5,505,494, issued Apr. 9, 1996, Ser. No. 123,277, Sep. 17, 1993.
Int. Cl.[6] B42D *15/10*
U.S. Cl. 283—75



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. An identification card with protection against falsification, comprising:

a card in the form of a thin, pocket-sized substrate having front and back surfaces;

two-dimensional human-organizable indicia imprinted on a first surface area of the card, including a graphical representation of an individual's facial likeness; and

a two-dimensional machine-readable code imprinted on a second surface area of the card, said two-dimensional code being imprinted using the same printing medium as that used to imprint said graphical representation,

said machine-readable code comprising an array of polygon-shaped printed cells and non-printed blank areas arranged along two independent axes, said array encoding data representative of said facial likeness in its entirety.

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REISSUES

SEPTEMBER 29, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,905

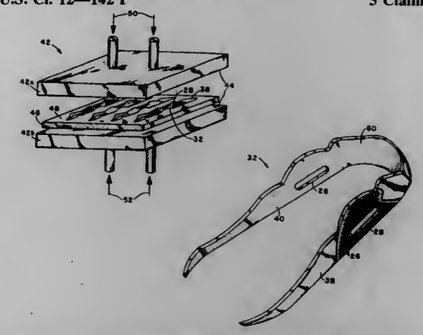
METHOD OF MANUFACTURING A MIDSOLE FOR A SHOE AND CONSTRUCTION THEREFOR

Stephen M. Vincent, and David L. Vattes, both of Beaverton, Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Original No. 5,396,675, dated Mar. 14, 1995, Ser. No. 710,381, Jun. 10, 1991. Application for reissue Mar. 14, 1997, Ser. No. 818,749

Int. Cl.[6] A43B *13/12*

U.S. Cl. 12—142 P **5 Claims**



4. A method of manufacturing a peripheral wrap element for a shoe midsole to be secured to a shoe outsole, the wrap formed from a plastic closed cell foam material, the wrap having an outer surface comprising at least a portion of an outer peripheral surface of said midsole, the wrap being separate from said outsole, said method comprising the steps of:

placing plastic closed cell foam material to form said peripheral wrap into a mold; and

compressing said plastic closed cell foam material with said mold to form a contoured outer surface of said wrap, wherein said contoured outer surface of said wrap comprises at least a portion of said outer peripheral surface of said midsole and is separate from said outsole, and wherein when said wrap is placed on said midsole, the compressive forces producing said contoured outer surface of said wrap have been directed substantially perpendicular with respect to said outer peripheral surface of said midsole.

Re. 35,906

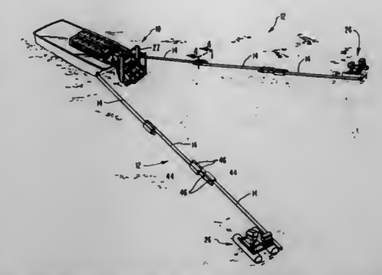
REMOTE CONTROL FLOATATION BOOM

Bruce C. Sanders, Ogden, Utah, assignor to Michael D. Swenson, Salt Lake City, Utah

Original No. 5,491,922, dated Feb. 20, 1996, Ser. No. 333,630, Nov. 3, 1994. Application for reissue Aug. 26, 1996, Ser. No. 703,054

Int. Cl.[6] A01K *79/00*

U.S. Cl. 43—6.5 **49 Claims**



35. A method for concentrating brine shrimp eggs at the surface of a body of water for the purpose of harvesting said brine shrimp eggs comprising the steps of:

(a) obtaining a pair of floatable tubes having an upper portion designed to float above the body of water surface and a lower portion designed to submerge below the body of water surface, said tubes having first and second ends, wherein a skirt is affixed to the lower portion of each tube and extends into the body of water, said skirt having first and second ends;

(b) attaching the first end of the tubes and skirts to a brine shrimp harvesting device such that the tubes and skirts extend outwardly from the brine shrimp harvesting device;

(c) attaching the second end of each tube and skirt to an unmanned drive device for propelling the floatable tubes through the body of water, said drive devices being remotely controllable;

(d) remotely controlling the drive devices in a manner such that the drive devices propel the floatable tubes through the body of water and form a wedge-shaped, concentrating angle which concentrates and funnels the brine shrimp eggs towards the harvesting device, such that brine shrimp eggs are concentrated at the water surface adjacent the harvesting device.

Re. 35,907

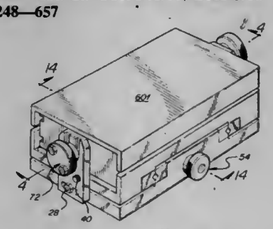
ADJUSTABLE BASE ASSEMBLY

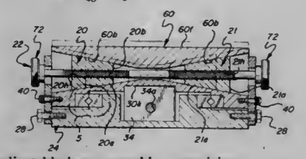
Robert E. Obrecht, Bloomfield Hills, Mich., assignor to REO Hydraulic Pierce & Form, Inc, Detroit, Mich.

Original No. 5,427,349, dated Jun. 27, 1995, Ser. No. 266,800, Jun. 27, 1994. Continuation of Ser. No. 867,482, Apr. 13, 1992, abandoned. Application for reissue Mar. 25, 1996, Ser. No. 622,244

Int. Cl.[6] F16M *13/00;* **B66F** *3/08*

U.S. Cl. 248—657 **11 Claims**





1. An adjustable base assembly comprising:

a generally planar horizontal base including end faces, a raised central portion between said end faces defining vertically oriented transversely extending surfaces facing outboard toward said end faces and positioned inboard of the respective end faces, and a pocket opening in the raised central portion;

a carriage positioned on the base and including:

a lower [wedge] plate [assembly] having end faces, an upper surface [defining a pair of upwardly converging wedge faces] *extending* between the end faces, *and* a lower surface defining

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vertically oriented transversely extending surfaces facing inboard and positioned inboard of the respective lower [wedge] plate [assembly] end faces and respectively confronting said transversely extending surfaces on the base[, and] ;

a threaded block extending downwardly from the lower surface of the lower [wedge] plate [assembly,] *and* including a transversely extending threaded through bore, [and] *said threaded block being* received in said pocket;

an upper [wedge] plate [assembly] having *end faces and* a lower surface [defining a pair of downwardly converging wedge faces] *extending between the upper plate end faces;*

at least one of said lower plate and said upper plate being a wedge plate, said wedge plate comprising a pair of converging wedge surfaces between the respective end faces;

a pair of wedge blocks [each having] *positioned between and in sliding engagement with the upper and lower plates, said wedge blocks coacting to define a pair of* converging [upper and lower] wedge faces in respective sliding engagement with [one of] said [upwardly] *pair of* converging wedge [faces and one of said downwardly converging wedge faces] *surfaces;*

a left threaded bore in one of said wedge blocks[,] ;

a right threaded bore in the other of said wedge blocks[,] ;

a vertical adjustment screw passing through said wedge block bores and having left and right threaded portions in respective threaded engagement with said left and right threaded bores[,] ;

means mounting the opposite ends of said vertical adjustment screw on said lower [wedge]plate [assembly] and operative to preclude axial movement of said vertical adjustment screw relative to said lower [wedge] plate [assembly] so that rotation of said vertical adjustment screw moves said wedge blocks toward and away from each other to raise and lower the upper [wedge] plate [assembly] relative to the lower [wedge] plate [assembly];

a horizontal adjustment screw extending through side walls of said raised central base portion, into said pocket and through said threaded bore of said threaded block; and

bearing means interposed between said confronting surfaces so that rotation of said horizontal adjustment screw moves said carriage transversely on said base.

Re. 35,908

NEUTRON INDIVIDUAL DOSE METER NEUTRON DOSE RATE METER, NEUTRON DETECTOR AND ITS METHOD OF MANUFACTURE

Hiroshi Kitaguchi, Naka-machi; Shigeru Izumi, Tokyo, and Akihasa Kaihara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 5,321,269, dated Jun. 14, 1994, Ser. No. 778,876, Apr. 26, 1991. Application for reissue Jun. 14, 1996, Ser. No. 662,229

Claims priority, application Japan, Apr. 24, 1990, 2-110092; WIPO, Apr. 26, 1991, PCT/JP91/00574

Int. Cl.[6] G01T *3/08;* **H01L** *31/115;31/00*

U.S. Cl. 250—370.05 **34 Claims**

30. A neutron detecting apparatus comprising one semiconductor detection element having different materials for producing charged particles in accordance with incident neutrons and for detecting the charged particles produced by the different materials, wherein the neutron detecting apparatus has at least one sensitivity value for neutrons having an energy over 1 MeV which is at least about 20 times greater than at least one sensitivity value for neutrons having an energy under 20 KeV.

Re. 35,909

SEAL HOUSING WITH HELICAL ELEMENT

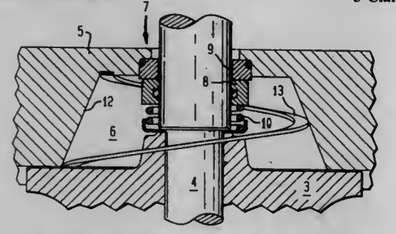
Johan Fondelius, Varvsgatan 4 11729, Stockholm, Sweden

Original No. 5,513,856, dated May 7, 1996, Ser. No. 330,145, Oct. 11, 1994. Application for reissue Dec. 13, 1996, Ser. No. 766,837

Claims priority, application Sweden, Nov. 17, 1993, 9303791

Int. Cl.[6] F16J *15/34*

U.S. Cl. 277—352 **3 Claims**



1. An improved housing for a pump which comprises a driving motor (1), a hydraulic part (2) with a rotary impeller (3) connected to the motor (1) by a shaft (4) and a seal housing (5) located between the motor (1) and the hydraulic part (2), the housing (5) contains a cavity (6) adjacent the impeller (3), within said cavity (6) and around the shaft (4) is a mechanical seal having a stationary sealing element (9), a rotary[,] sealing element (8), and a compression spring (10) urging the elements (8), (9) into engagement, wherein the improvement comprises:

said cavity (6) having a conical shape and an [annual] *annular* wall surface (12), and a [single] helical element (*11*), (13) [is positioned in said cavity (6)] spaced from said mechanical seal and [engaging] *extending* from top to bottom of said wall surface (12), whereby a liquid present near said wall surface (12) is directed toward said impeller (3) due to rotary motion that the liquid obtains when the shaft (4), *rotary* element (8) and spring (10) rotate.

Re. 35,910

MOVING IMAGE SIGNAL ENCODING APPARATUS AND DECODING APPARATUS

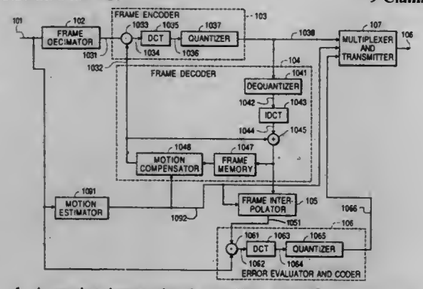
Atsushi Nagata; Kenichi Takahashi, and Nobuyasu Takeguchi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 5,113,255, dated May 12, 1992, Ser. No. 522,121, May 11, 1990. Application for reissue May 12, 1994, Ser. No. 241,810

Claims priority, application Japan, May 11, 1989, 1-118004; Jun. 26, 1989, 1-163059; Jun. 29, 1989, 1-169230

Int. Cl.[6] H04N *7/50*

U.S. Cl. 348—416 **9 Claims**



1. A moving image signal encoding apparatus comprising: a frame decimator for extracting [the encoded] frame from an input moving image signal at specified intervals; a frame encoder for encoding said [encoded] frames *extracted by said decimator* to obtain frame codes; a frame interpolator for producing interpolated frames positioned between said [encoded] *extracted* frames from said frame codes; an error evaluator for evaluating errors of said interpolated frames, and a transmitter for transmitting said frame codes and output signals of said error evaluator as an output of the moving image signal encoding apparatus.

Re. 35,911

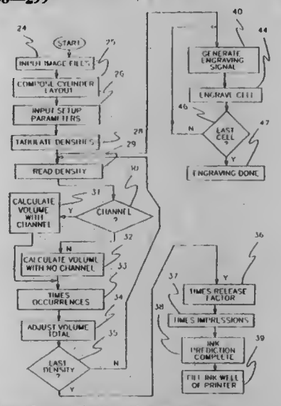
METHOD FOR PREDICTING INK COMSUMPTION

David R. Seitz, Vandalia, and Juli Ann Stuve, Dayton, both of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Original No. 5,402,246, dated Mar. 28, 1995, Ser. No. 97,061, Jul. 20, 1993. Application for reissue Mar. 28, 1997, Ser. No. 828,321

Int. Cl.[6] B41C *1/02;* **G01C** *11/28*

U.S. Cl. 358—299 **83 Claims**



45. A system for managing ink comprising:

input means for inputting at least one parameter associated with at least one ink-receiving area; and

means for receiving image data for at least a portion of an image to be engraved; for determining densities associated with said image, said densities being determined without simultaneously rotatably scanning said at least a portion of said image to be engraved; and also for using said at least one parameter and said densities for facilitating the management of ink.

Re. 35,912

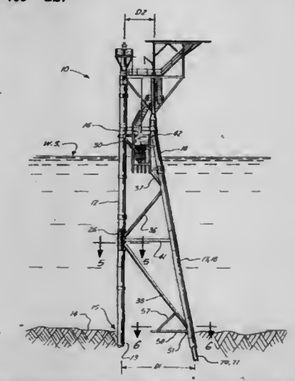
METHOD OF INSTALLING LEAN-TO WELL PROTECTOR

Ricardo R. Gomez de Rosas, 3609 Lake Winnipeg, and Esteban O. Suarez, 1728 Lake Michigan Dr., both of Harvey, La. 70058

Original No. 5,051,036, dated Sep. 24, 1991, Ser. No. 503,134, Apr. 2, 1990. Continuation of Ser. No. 127,381, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 428,485, Oct. 31, 1989, abandoned, which is a continuation of Ser. No. 236,637, Aug. 25, 1988, abandoned. Application for reissue Dec. 22, 1995, Ser. No. 579,061

Int. Cl.[6] E02D *5/00*

U.S. Cl. 405—227 **7 Claims**



7. A method of installing an offshore oil/gas well with a mobile drilling rig having a lifting device thereon that is transported to an offshore well site, comprising the steps of:

a) installing an upstanding conductor pipe with the drilling rig at the well site in a first well drilling position;

b) transporting a jacket truss to the well site using a floating barge-like vessel, the truss including a pair of elongated hollow legs;

c) installing drive piles in each leg of the jacket truss;

d) lifting the jacket truss from the barge using the lifting device on the drilling rig and wherein the drilling rig remains in said first well drilling position;

e) positioning the jacket truss adjacent the conductor pipe using the drilling rig and its lifting device in said first position;

f) securing the Jacket truss to the conductor pipe using one or more removable clamps each spaced substantially above the sea bed; and

g) securing the Jacket leas to the sea bed by driving the drive piles with the mobile drilling rig.

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PLANT PATENTS

GRANTED SEPTEMBER 29, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,616

SHRUB ROSE PLANT NAMED 'JACCHARI'

John K. Walden, Thousand Oaks, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Dec. 17, 1996, Ser. No. 768,858

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the shrub class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its small five-petaled, bright, deep-pink flowers born in large clusters; dark green, glossy foliage; arching and mounding growth habit; disease resistance; and rapid repeat flowering.

10,617

SHRUB ROSE PLANT NAMED 'AUSKY'

David Charles Henshaw Austin, Albrighton, England, assignor to David Austin Roses Limited, Albrighton, England

Filed Jan. 24, 1997, Ser. No. 788,677

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of shrub rose plant of the *Rosa hybrida* class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its extreme disease resistance; excellent repeat flowering; attractive strong pink, small flowers held in large bunches; and attractive shrubby growth.

10,618

SHRUB ROSE PLANT NAMED 'AUSCOOK'

David Charles Henshaw Austin, Albrighton, England, assignor to David Austin Roses Limited, Albrighton, England

Filed Jan. 24, 1997, Ser. No. 788,745

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of shrub rose plant of the *Rosa hybrida* class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dark pink flowers; attractive rounded flower which opens to show stamens; strong fragrance; repeat flowering; and attractive shrubby, arching growth.

10,619

HYBRID TEA ROSE PLANT NAMED 'RUIKWIEN'

A. A. Pouw, Kwakel, Netherlands, assignor to De Ruiter's Nieuwe Rozen B.V., Kwakel, Netherlands

Filed Dec. 5, 1996, Ser. No. 759,607

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

10,620

HYBRID TEA ROSE PLANT NAMED 'DELBLACREM'

Guy Delbard, Hyeres, France, assignor to Societe Anonyme Des Pepinieres et Roserales Georges Delbard, Commentry, France

Filed Feb. 14, 1997, Ser. No. 800,059

Claims priority, application France, Dec. 19, 1996, 15220

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) from a physical point of view forms green mature wood, assumes an upright growth habit, and forms attractive long-lasting ivory double flowers having consistent petals, and
(b) from the biological point of view forms vigorous vegetation, produces flowers in abundance, exhibits the ability readily to be forced, and is very resistant to diseases when grown under greenhouse conditions;

substantially as herein shown and described.

10,621

HYBRID TEA ROSE PLANT NAMED 'DELSTRIBUC'

Guy Delbard, Hyeres, France, assignor to Societe Anonyme Des Pepinieres et Roserales Georges Delbard, Commentry, France

Filed Feb. 14, 1997, Ser. No. 800,752

Claims priority, application France, Aug. 6, 1996, 15018

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—13 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) from a physical point of view forms green mature wood, assumes an upright to bushy growth habit, and forms attractive long-lasting bright red velvet double flowers that are striped with yellow or white having consistent petals, and
(b) from the biological point of view forms semi-vigorous to vigorous vegetation, produces flowers in abundance, exhibits the ability readily to be forced, and is very resistant to diseases when grown under greenhouse conditions,

substantially as herein shown and described.

10,622

HYBRID TEA ROSE PLANT NAMED 'MEICOBUIS'

Alain A. Meilland, Antibes, France, assignor to CP (Delaware), Inc., Wilmington, Del.

Filed Jul. 31, 1997, Ser. No. 904,439

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—17 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive long lasting large double blossoms that are Brick Red on both surfaces,
(b) exhibits an erect growth habit,
(c) forms dense semi-glossy foliage, and
(d) is particularly well suited for cut flower production under greenhouse growing conditions;

substantially as herein shown and described.

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10,623
VARIETY OF APPLE TREE BEL-EL
Kris Wouters, Rummen, Belgium, assignor to Jomobel NV, Belgium
Filed Jan. 13, 1997, Ser. No. 783,405
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—34.1 **1 Claim**

1. The new and distinct variety of apple tree named Bel-El as described and illustrated, and which is particularly characterized over its parent variety by the red solid flush and longer, thinner brown/red stalk of its fruit; by the earlier picking dates of its fruit; by the tree's distinctly-colored branches which have a red/brown upper side and a green/brown underside and leaves in which the petioles and nerves are green on the upper side and dark purple/red on the underside; and by its less dense, bushy foliage than its parent variety.

10,624
ASTER PLANT NAMED 'KARMIJN'
Petrus J. Akerboom, Ter Aar, Netherlands, assignor to De Nachtvlinder B.V., Ter Aar, Netherlands
Filed Jun. 17, 1996, Ser. No. 664,520
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new distinct cultivar of aster plant named 'Karmijn', as illustrated and described herein.

10,625
AFRICAN VIOLET PLANT NAMED 'IMPROVED HAWAII'
Reinhold Holtkamp, Sr., Rees-Haffen, Germany, assignor to International Plant Breeding A.G., Bern, Switzerland
Filed Feb. 7, 1997, Ser. No. 798,295
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—69.2 **1 Claim**

1. A new and distinct cultivar of African violet plant named Improved Hawaii, as described and illustrated, and particularly characterized by its single to semi-double, star-shaped, purplish blue flowers with fine white wavy edges; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; dark green, oval to heart-shape, slightly serrated leaves; profuse flowering; vigorous and compact growth habit; flowering 9–10 weeks after potting, and by its long lasting and non-dropping flowers.

10,626
LONGIFLORUM ×ASIATIC HYBRID LILY PLANT NAMED 'CEB CHARM'
Donald L. Egger, Wilsonville, Oreg., assignor to Cebeco Lilies, Inc., Aurora, Oreg.
Filed Jan. 23, 1997, Ser. No. 787,622
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinct cultivar of Longiflorum-Asiatic hybrid lily plant substantially as herein shown and described.

10,627
SPATHIPHYLLUM PLANT 'JUNGFRAU'
Danny DeClercq, Destelbergen, Belgium, assignor to Twyford International, Inc., Santa Paula, Calif.
Filed Apr. 4, 1997, Ser. No. 833,141
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Spathiphyllum plant named 'Jungfrau', as illustrated and described.

PATENTS

GRANTED September 29, 1998

ERRATA

Patents

For CLASS	See PATENT NO.
004—665	5,813,047
068—202	5,813,216
182—003	5,813,486
184—006	5,813,493
280—728	5,813,707
475—297	5,813,937
475—331	5,813,938
604—890	5,813,999
623—002	5,814,096
435—402	5,814,550
422—082	5,814,565
254—131	5,814,842
313—638	5,814,944
372—025	5,815,494
399—113	5,815,644

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PATENTS

GRANTED SEPTEMBER 29, 1998

GENERAL AND MECHANICAL

5,813,047

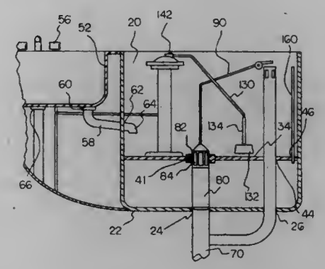
TOILET FLUSHING SYSTEM THAT ALLOWS USE OF GRAY WATER DRAINED FROM A SINK

Darrick Teichroeb, R.R. #3 Noble Road, Armstrong, BC, Canada, V0E 1B0

Filed Feb. 12, 1997, Ser. No. 799,500

Int. Cl.[6] E03C *1/01*

U.S. Cl. 4—665 **2 Claims**



1. A toilet flushing system that allows use of gray water drained from a sink comprising:

a toilet having a bowl with a basin, a water tank for providing water for flushing and with the tank having a hollow interior, a bottom wall with a lower drain hole, a periphery extended upwards from the bottom wall to define a top opening, and an inner wall extended across the interior and coupled to the periphery to define an upper compartment and a lower compartment and with the inner wall having an upper drain hole formed thereon and positioned in axial alignment with the lower drain hole;

a sink having a drain pipe extended within the upper compartment of the tank, the sink further having a second drain pipe extended vertically downwards and connected to a conventional sewer;

a connecting channel extended through the bowl and having a lower end in communication with the basin and an upper end in communication with the lower drain hole;

an elongated flush tube slidably inserted within the upper drain hole and with the flush tube having an upper end with a plurality of perforations formed thereon and a lower closed plug end;

flushing assembly having one orientation for permitting the flush tube to be positioned at a location that allows flow of water from the upper compartment to the lower compartment through the perforations thereof and further prevents flow of water into the connecting channel, the flushing assembly further having another orientation that prevents flow of water from the upper compartment to the lower compartment and further permits water to flow into the connecting channel and to the bowl for flushing; and

an overflow tube disposed within an associated bore of the inner wall and another bore of the bottom wall of the tank, the overflow tube having an open lower end coupled to the connecting channel and an upper perforated end extended to a location above a preset level and below a water supply valve and with water that rises to a level above the preset level draining through the perforations of the overflow tube to the bowl.

5,813,048

HELMET VISOR RELEASE APPARATUS

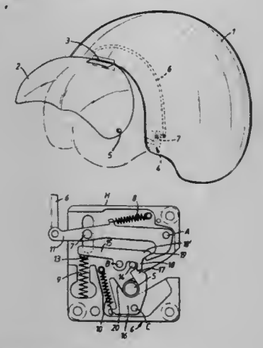
Ian Graham Thom, Edinburgh, Great Britain, assignor to GEC-Marconi Avonics (Holdings) Limited, Stanmore, Great Britain

Filed Jul. 12, 1996, Ser. No. 679,214

Claims priority, application United Kingdom, Aug. 1, 1995, 9515764

Int. Cl.[6] A42B *3/22*

U.S. Cl. 2—6.5 **11 Claims**



8. A combination including:

a helmet;

a visor attached to the helmet; and

a helmet visor release apparatus comprising:

a pair of manually actuatable catches, each of the catches having:

a first portion disposed on the helmet; and

a second portion adapted to be disposed on a visor of the helmet, the first portion having means for releasably engaging the second portion, the means for releasably engaging being manually actuatable at said each of the catches for releasing the second portion from the first portion thereby releasing said each of the catches; and

a linkage mechanism connecting the catches to one another and being configured such that manual release of one of the catches causes a release of another one of the catches.

5,813,049

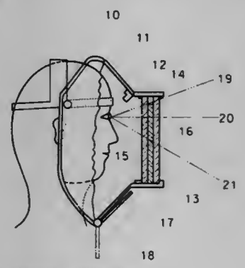
WELDING HELMET

Long Xu, 88-45 Eldert La., Woodhaven, N.Y. 11421

Filed Dec. 17, 1996, Ser. No. 767,850

Int. Cl.[6] A42B *1/00*

U.S. Cl. 2—8 **8 Claims**



1. A welding helmet comprising:

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a housing unit configured to completely cover a user's face and neck;

a headband attached to the housing unit for attaching the helmet to the user's head;

said headband pivots from said housing unit for ease in donning and removing the helmet from the user's head;

said housing unit includes a mother view window constructed of two clear transparent glasses and a shade glass therebetween;

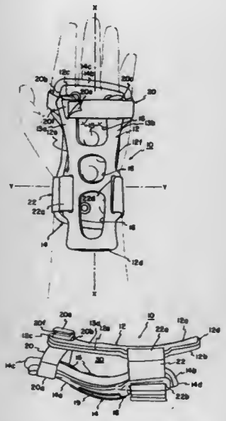
said shade glass between said two transparent glasses is shorter in length that said two transparent glasses thereby forming a clear first son view window at the top of the mother window and a second son view window below said first son view window.

5,813,050

WRIST GUARD

Sherry S. Popowski, Minneapolis, Minn., assignor to Rollerblade, Inc., Minneapolis, Minn.

Filed May 7, 1997, Ser. No. 852,359
Int. Cl.[6] A41D *13/08*
U.S. Cl. 2—16 **7 Claims**



1. A wrist guard comprising:

a first rigid member having:

a first longitudinal axis extending from a front end to a rear end;

a length selected for said front end to be disposed at a knuckle line of a back of a user's hand with said first rigid member extending centrally along said back of said hand and beyond a wrist of said user for said rear end to be disposed over a back side of a forearm of said user;

side edges extending from said front end to said rear end and symmetrical about said first longitudinal axis;

a second rigid member having:

a second longitudinal axis extending from a front end to a rear end;

a length selected for said front end to be disposed at a first joint line of a palm of a user's hand with said second rigid member extending centrally along said palm of said hand and with said length of said second rigid member less than said length of said first rigid member;

side edges extending from said front end to said rear end and symmetrical about said second longitudinal axis;

said first and second rigid members disposed in parallel spaced-apart alignment;

a fastener including:

a first strap adjacent said front ends of said first and second rigid members having a free end releasably secured in any one of a plurality of fixed positions to selectively adjust a spacing between said front ends;

a second strap connecting said first and second rigid members at said wrist and having a free end releasably secured in any one of a plurality of fixed positions to selectively adjust a spacing between said first and second rigid members at said wrist;

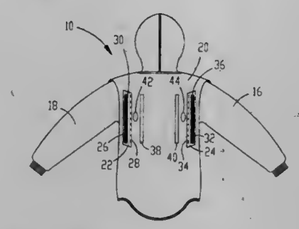
opposing edges of said first and second straps defining spaces on opposite sides of said rigid members with each of said spaces sized to pass a thumb of said user.

5,813,051

GARMENT HAVING REMOVABLE PATCH

David C. Counter, 2815 SW. 31st St Ct., Apt. 308, Topeka, Kans. 66614

Filed Mar. 18, 1997, Ser. No. 819,780
Int. Cl.[6] A41D *1/00*
U.S. Cl. 2—69 **7 Claims**



1. A garment comprising:

a body having an outwardly facing portion;

an elongated flap presenting a pair of opposed elongated edges, one of the elongated edges of the flap being attached to the outwardly facing portion of the garment;

a removable patch presenting opposed faces and first and second side edges, the patch bearing indicia on at least one of the faces; and

a retaining means for removably retaining one of the side edges of the patch between the flap and the outwardly facing portion, the retaining means including fastening structure mounted on each of the faces of the patch and corresponding fastening structure mounted on the flap and the outwardly facing portion.

5,813,052

ZONED SURGICAL GOWN

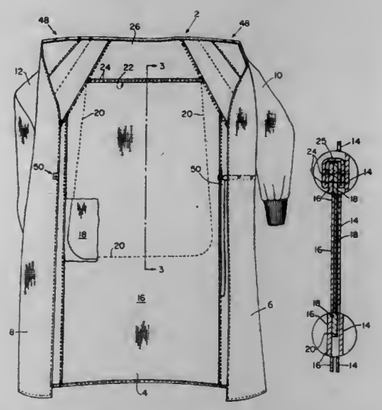
Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Co., Inc., Cincinnati, Ohio

Filed Nov. 1, 1993, Ser. No. 146,498
Int. Cl.[6] A41D *13/00;13/04*
U.S. Cl. 2—114 **11 Claims**

1. A surgical gown having a front panel and sleeves integrally connected to said front panel, said front panel having a central operative field comprising:

(i) an outer layer of a liquid repellent, moisture vapor transmitting material;

(ii) an inner layer of a breathable material; and



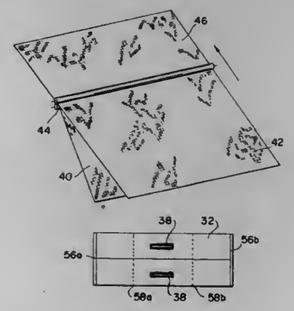
(iii) an intermediate layer of a liquid proof material interposed between said outer and inner layers.

5,813,053

SELF-RESTRAINING NECKTIE

Vincent J. Pileggi, 1847 Dillon Rd., Maple Glen, Pa. 19002

Continuation of Ser. No. 818,081, Jan. 8, 1992, Pat. No. 5,239,707, which is a continuation-in-part of Ser. No. 774,796, Oct. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 724,835, Jul. 2, 1991, abandoned. This application Jul. 12, 1993, Ser. No. 89,375
Int. Cl.[6] A41D *25/00;27/00*
U.S. Cl. 2—145 **4 Claims**



1. A self-restraining necktie which comprises:

a necktie made from an original material having an outward facing section with a front and a back and a tail section, said tail section being oriented behind said outward facing section in normal wearing position;

a vertical member formed from a sheet of stiffened cloth, said sheet of stiffened cloth made by bonding a sheet of the original material to a fusion cloth;

a horizontal member having at least one buttonhole, therein formed from said sheet of stiffened cloth by cutting an elongate length from said stiffened cloth, folding said cut length lengthwise, sealing said folded cut length to form a tube, and cutting the tube perpendicular to its length; and

wherein the horizontal member is slidably secured around the vertical member and the vertical member is attached to the rear of the outward facing section.

5,813,054

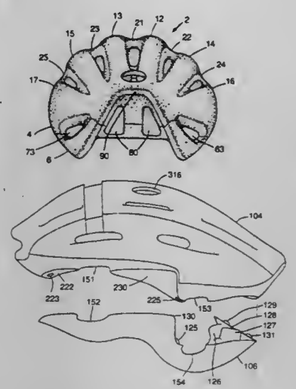
Patent Not Issued For This Number

5,813,055

BICYCLE HELMET

F. Robert Egger, Watsonville, Calif., assignor to Specialized Bicycle Components, Inc., Morgan Hill, Calif.

Continuation of Ser. No. 784,738, Jan. 16, 1997, Pat. No. 5,745,924, which is a continuation of Ser. No. 526,451, Sep. 11, 1995, Pat. No. 5,651,145, which is a continuation of Ser. No. 123,728, Sep. 17, 1993, Pat. No. 5,450,631. This application Nov. 7, 1997, Ser. No. 966,050
Int. Cl.[6] A42B *3/00*
U.S. Cl. 2—425 **9 Claims**



3. A bicycle helmet, comprising:

a foam helmet body having a plurality of longitudinally extending valleys on an outer surface thereof, the valleys extending from a front portion of the foam helmet body to a rear portion of the foam helmet body, the valleys having longitudinally elongated vents therethrough, and a first rear opening through a surface of the foam helmet body that is below the most rearward margin of the foam helmet body; and

helmet retention means for securing the helmet to a user's head.

5,813,056

HYDRODYNAMIC GOGGLES STRAP

Richard W. Ambrose, 15 Vista del Mar, Santa Barbara, Calif. 93109

Filed Jan. 17, 1996, Ser. No. 587,678
Int. Cl.[6] A61F *9/02*
U.S. Cl. 2—452 **26 Claims**

1. A strap for attachment to eyewear and for applying inward pressure against a wearer's ears, comprising a unitary piece of material having a first ear restraining member and a second ear restraining member wherein each of said ear restraining members has a height, a forward edge, and a back edge located distally from said forward edge, a plurality of elongatable bands connecting said back edges of said first and second ear restraining members wherein each of said plurality of bands has a height, a first extension that has a height, is connected to said forward edge of said first ear restraining member, and is connectable to said eyewear, and a second extension that has a height, is connected to said forward edge of said second ear restraining member, and is connectable to said eyewear, further wherein said heights of said first

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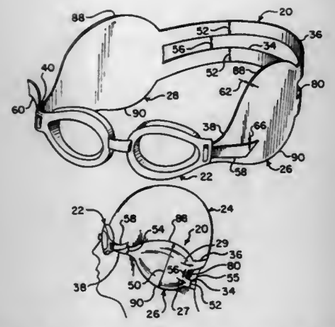
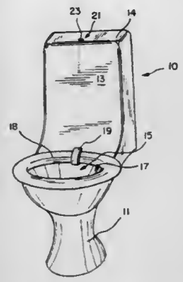


and second ear restraining members are larger than said heights of each of said plurality of bands and said first and second extensions.

5,813,057
SELF-SANITIZING TOILET SEAT CLEANING APPARATUS
Jacques Descent, and Jean Langevine, both of St. Petersburg, Fla., assignors to Delan, Inc., St. Petersburg, Fla.
Filed Sep. 17, 1997, Ser. No. 931,929
Int. Cl.[6] A47K *13/00*
U.S. Cl. 4—233 **13 Claims**



10. A self-sanitizing toilet seat cleaning apparatus for a toilet having a flushing mechanism, comprising:

a) a base having a bowl and a seat rotatably mounted above said bowl wherein the base is connected to an upright tank;

b) a motor mounted in said tank and having a rotary drive shaft coupled to said seat via a gear mounted circumferentially under said seat coupled to a gear on said drive shaft, whereby rotations of said drive shaft rotate said seat;

c) an arm extending from said tank and overlying said seat, said arm having a flow passage therethrough adapted to convey disinfectant liquid onto said seat and into said bowl, said flow passage comprising a first passage adapted to convey disinfectant liquid over said arm, a second passage adapted to convey disinfectant liquid over said seat and a third passage adapted to convey disinfectant liquid under said seat and into said bowl;

d) a reservoir of disinfectant liquid in said tank and fluidly connected to said flow passage via a pump, and a level sensor adapted to sense level of disinfectant in said reservoir and an indicator coupled to said level sensor and adapted to indicate level of disinfectant therein;

e) a wiper mounted under said arm and having a wiping surface configured in conformity with an upper surface of said seat;

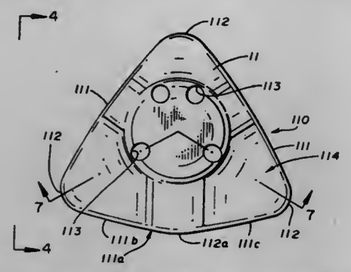
f) a weight sensor sensing a weight on said seat and sending a signal when said weight is above a pre-set threshold;

g) actuator means for actuating said apparatus including a controller, said controller being adapted to receive said signal and only actuating said flushing mechanism and said motor and pump when no signal is being received from said weight sensor;

h) a proximity sensor on said tank and adapted to sense proximity of a hand or object and, responsive thereto, to send a further signal to said controller, said controller receiving such a further signal and, responsive thereto, provided a signal from said weight sensor is not concurrently received, actuating said flushing mechanism and activating said pump and motor for pre-set periods of time; and

i) a timer connected to said controller, said controller activating said timer responsive to cessation of said weight sensor signal and automatically activating said flushing mechanism, motor and pump in the absence of receipt of a further signal from said proximity sensor within a pre-set time period measured by said timer.

5,813,058
DISSOLVABLE URINAL SCREEN
John R. Quigley, Garfield Heights, Ohio, and Gary R. Borofsky, Rydal, Pa., assignors to The Tranzonic Companies, Pepper Pike, Ohio
Filed Jan. 27, 1997, Ser. No. 791,482
Int. Cl.[6] E03F *13/00*
U.S. Cl. 4—309 **18 Claims**



1. A screen for urinals having a bottom wall with a drain opening centrally disposed therein, comprising:

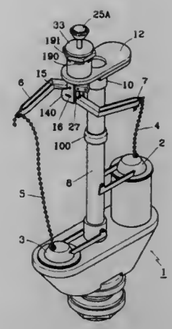
a) a block of material dimensioned to rest on the bottom wall of the urinal and overlie the drain opening thereof, said material being dissolvable when contacted by urine so as to release at least one of a deodorant and a sanitizing agent;

b) said block of material having a plurality of through openings therein functioning as a screen to restrain passage of foreign matter, and

c) said block of material having top and bottom surfaces, having contoured areas to enhance passage of urine.

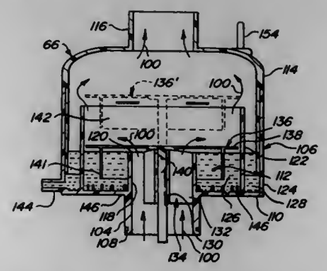
5,813,059
TWO-STAGE WATER-SAVING FLUSHING DEVICE FOR A TOILET TANK
Kuo-Hsin Wang, 9F3R,NO.210, Chung Hsueh Rd., Tainan, Taiwan
Filed Oct. 7, 1996, Ser. No. 726,779
Int. Cl.[6] E03D *1/14*
U.S. Cl. 4—325 **3 Claims**

1. A two-stage water-saving flushing device adapted to be fixed in a toilet tank comprising a flushing unit having a high-level exit tube and a low-level exit tube, both said exit tubes respectively provided with a valve, both said valves respectively connected with a first arm and a second arm by means of separated chains, a pressing unit at least including a base plate for securing said two arms, said base plate having a vertical cylinder standing upright



thereon, said cylinder having female threads in an inner wall and a hole in a bottom side, a tube base positioned under said base plate at one side thereof and secured to an overflow tube, said first arm positioned under said base plate, said second arm positioned under said first arm, said cylinder housing a function rod of said pressing unit, a pressing tube of said pressing unit having a spring respectively fitting around an upper portion and a lower portion thereof, said pressing tube having a bottom end resting on an outer surface of one end of said first arm, said pressing tube having a center hole for said function rod of said pressing unit to pass through, said function rod having a flange in an intermediate portion thereof for limiting movement of said function rod and a stopper connected to said cylinder by means of engagement of male threads of said stopper and said female threads of said cylinder, and said function rod protruding up through said stopper and screwed to a button, said button pressed down to move down said function rod for flushing a larger amount of water and pulled up for flushing a small amount of water.

5,813,060
MULTIFUNCTION TOILET
Stanislaw Klopocinski, 38548 Warwickshire, Sterling Heights, Mich. 48312
Filed Sep. 12, 1996, Ser. No. 713,144
Int. Cl.[6] E03D *9/052*
U.S. Cl. 4—351 **6 Claims**



1. A multifunction toilet including a toilet bowl with a flushing ring manifold adjacent the top of said bowl and a water trap seal between said bowl and a siphon outlet to a sewage waste drain; a water supply tank incorporating a flushing mechanism with a valve controlled outlet to said flushing ring manifold and a level control including an overflow tube in communication with said bowl; and a ventilating system for withdrawing gases from said bowl for odor control comprising:

an exhaust fan connected to an air outlet of said toilet bowl;

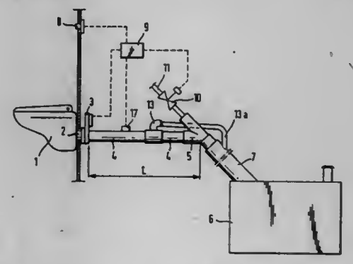
an odor extraction trap and valve assembly connected to said fan and to a gas disposal outlet, said connection to a gas disposal outlet includes an air conduit connected to said sewage waste drain downstream of said bowl water trap seal;

said assembly having a water sump and a valve with a moving member extending into said sump in a closed position of said valve to prevent backflow of gas from said gas disposal outlet;

said odor extraction trap and valve assembly includes a housing having an air inlet connected to said exhaust fan, said air inlet including a vertically oriented tubular member extending upwardly into said housing through said water sump terminating in an end defining a water level overflow weir and the valve of said odor extraction trap and valve assembly comprises a valve stem guide sleeve centrally located in said tubular member, and said moving valve member includes a circular top plate having a vertically depending valve stem movably supported in said guide sleeve and a tubular valve skirt depending from said top plate so as to extend into said sump to form a water seal; whereby when said exhaust fan is operating, lifting said inlet valve, said tubular valve skirt will be lifted above said water sump creating said air flow path; and

wherein when said exhaust fan is operating creating an airflow from said bowl air outlet, the air flow will lift said moving valve member to an open valve position creating an air flow path above said water sump, and when said exhaust fan is turned off, said moving valve member will return to its closed position.

5,813,061
AIR PRESSURE DRIVEN VACUUM SEWER SYSTEM
Hans Törnovist, Bromölla, Sweden, assignor to Evac AB, Bromolla, Sweden
Continuation of Ser. No. 359,276, Dec. 16, 1994, abandoned. This application Jul. 5, 1996, Ser. No. 674,580
Claims priority, application Sweden, Dec. 20, 1993, 9304217
Int. Cl.[6] E03D *11/00*
U.S. Cl. 4—431 **7 Claims**



1. A vacuum sewer system comprising at least one waste receiving unit to be emptied, said unit having an outlet opening, a sewer pipe having an upstream end and a downstream end, a normally closed sewer valve at the outlet opening of the waste receiving unit and connected between the outlet opening of the waste receiving unit and the upstream end of the sewer pipe, a sewage collecting container connected to the sewer pipe at the downstream end thereof for collecting sewage from the sewer pipe, an ejector having a suction pipe in communication with the sewer pipe, a discharge pipe, and a working medium supply inlet, whereby a considerable partial vacuum is created in the suction pipe when the sewer valve is in closed position and a pressurized working medium is supplied to the ejector by way of the working medium supply inlet so that sewage in the waste receiving unit is forced into the sewer pipe when the sewer valve is opened,

wherein the ejector is a gas-driven ejector and is integrated into the sewer pipe so that the suction pipe and the discharge pipe of the ejector form respective parts of the sewer pipe, thereby dividing the sewer pipe into an upstream portion, in which sewage is transported due to pressure difference between the ambient atmosphere and partial vacuum created by the ejec-

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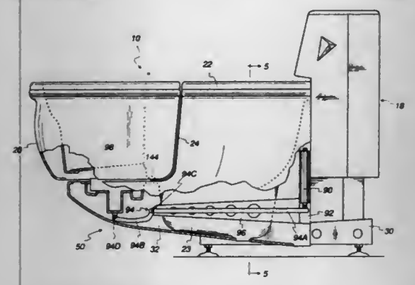
tor, and a downstream portion, in which sewage transport is at least assisted by pneumatic pressure created by the ejector in its discharge pipe, and

wherein between the waste receiving unit and the ejector there is at least one security device arranged to rapidly dissipate pressure if the pressure between the ejector and the waste receiving unit exceeds the pressure in the waste receiving unit when the sewer valve is open, the security device being a relief valve in the form of a flexible hose which is normally in a bent position in which a closing fold is formed in the hose.

5,813,062
SIDE ENTRY BATHTUB

Robert Edward Vago, Northbrook, Ill., and Dale Owen Carmine, York, Nebr., assignors to Arjo USA, INC., Aurora, Nebr.

Continuation of Ser. No. 178,938, Jan. 7, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 471,565
Int. Cl.[6] A47K *3/02*
U.S. Cl. 4—556 **7 Claims**



1. A bathtub, comprising:

a stationary bathtub portion;

a movable bathtub portion having a seat formed thereon, said movable bathtub portion being movable between an open position in which said movable bathtub portion is not sealed with said stationary bathtub portion and a closed position in which said stationary bathtub portion is sealed with said movable bathtub portion;

a sealing member attached to one of said bathtub portions;

first means for pivoting said movable bathtub portion in a first direction relative to said stationary bathtub portion; and

second means for lifting said movable bathtub portion in a second direction relative to said stationary bathtub portion.

5,813,063
PORTABLE SINK

Louis Scott Watkins, P.O. Box 1678, Grass Valley, Calif. 95945, and Shawn Mathews, 519 Nimrod, Nevada City, Calif. 95959

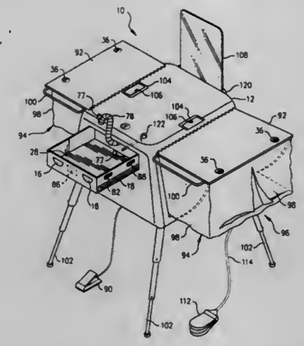
Continuation-in-part of Ser. No. 506,686, Jul. 25, 1995, abandoned. This application May 1, 1997, Ser. No. 846,462
Int. Cl.[6] A47K *1/02*
U.S. Cl. 4—626 **19 Claims**

1. A portable sink, comprising:

(a) a housing;

(b) a basin movably mounted to the housing, the basin movable from a recessed position in the housing, to an extended position from the housing, the basin including an outlet for draining fluids from the basin; and

(c) a drain tank disposed in the housing and having an inlet, the outlet from the basin being remote from the inlet to the drain tank when the basin is in the inserted position and the drain tank is in the housing, and the outlet from the basin aligning with the inlet to the drain tank when the basin is in the

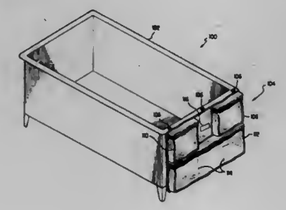


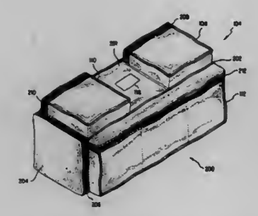
extended position and the drain tank is in the housing, where fluid in the basin is directed through the outlet into the inlet of the drain tank.

5,813,064
PORTABLE PLAYYARD STORAGE SYSTEM

Curtis Michael Hartenstine, Morgantown, Pa., assignor to Graco Children's Products Inc., Eleverson, Pa.

Filed Aug. 7, 1996, Ser. No. 694,475
Int. Cl.[6] A47D *7/00;15/00*
U.S. Cl. 5—99.1 **20 Claims**





1. A portable playyard system, comprising:

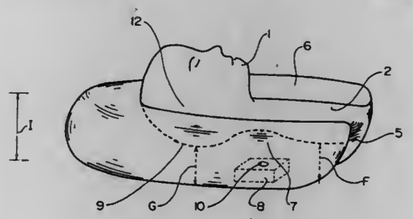
a playyard structure adapted to be folded into a generally rectangular shape; and

a carrying case adapted to hold the playyard structure, the carrying case having a plurality of pockets and at least one connector, and the carrying case being adapted to be opened into a substantially flat configuration and to be connected to the playyard structure via the at least one connector to expose the plurality of pockets facing away from the playyard structure.

5,813,065
CONTOUR SHAPED THERAPEUTIC PILLOW

Petra C. Tinhorn, 535 Oaks Dr.- Apt. 502, Pompano Bch, Fla. 33069

Filed Jun. 9, 1995, Ser. No. 418,021
Int. Cl.[6] A47C *20/02*
U.S. Cl. 5—639 **4 Claims**

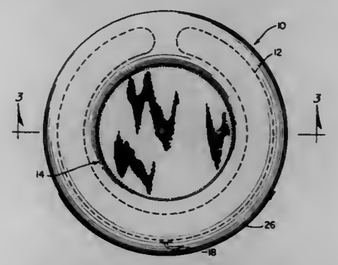


1. A music emitting pillow for supporting the head and neck of a user prior to the onset of sleep and for turning off and on music in response to the lifting up of the user's head, said pillow comprising: a pillow having a music producing means; a pressure activated switch in connection with said music producing means for turning off and on said music in response to changes in pressure upon said switch, said pillow having a neck support channel of size adapted to enclose the neck of the user on three sides and limit the movements of the user's head and neck, a head depression in connection with said neck channel, said head depression of size adapted to support the back of the user's head, said pressure activated switch in connection with said head depression so as to turn off and on said music in response to changes in pressure upon said head depression.

5,813,066
BABY REST

Albert W. Gebhard, 2101 East Alameda, Denver, Colo. 80209; Michelle D. Watson, and Janine Meachen, both of 11 Eastgate St., Oakleigh, 316 VIC, Australia

Filed Jul. 15, 1996, Ser. No. 680,381
Int. Cl.[6] A47C *20/02*
U.S. Cl. 5—655 **4 Claims**



1. A baby rest for placement on a support surface, comprising:

an outer support member including a generally C-shaped tubular member terminating short of a full circle and resilient padding encasing said tubular member and extending throughout a full circle;

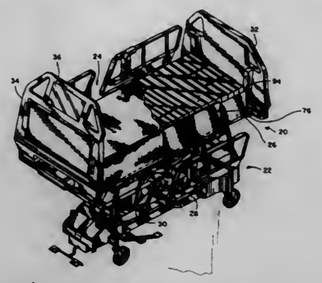
a central rest layer surrounded by said support member for elevation above said support surface and said support member extending above and below said layer thereby preventing an infant on said layer from rolling off said layer; and

an outer cover snugly encasing said support member and said layer.

5,813,067
METHOD AND APPARATUS FOR SUPPORTING AND FOR SUPPLYING THERAPY TO A PATIENT

Richard B. Stacy; Craig D. Ellis, both of Charleston; Barry D. Hand; James M. C. Thomas, both of Mt. Pleasant; Kenith W. Chambers; Stephen E. Glover, both of Charlestown; Richard I. Barnett; Paul B. King, both of Mount Pleasant, all of S.C.; Ryszard S. Ozarowski, Marietta, Ga., and William T. Sutton, Charleston, S.C., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Continuation of Ser. No. 196,847, Feb. 15, 1994, Pat. No. 5,586,346. This application Dec. 23, 1996, Ser. No. 780,050
Int. Cl.[6] A61G *7/057*
U.S. Cl. 5—713 **25 Claims**



1. A bed for supporting a patient, comprising:

a support frame;

a support plate assembly coupled to said support frame, said plate assembly having a plurality of plate sections hingedly connected to one another;

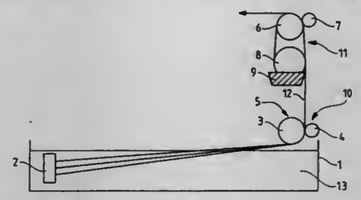
a plurality of generally longitudinally extending inflatable cells positioned on said plate sections of said plate assembly, at least one of said cells is inflatable generally independently of another laterally offset longitudinal cell;

an inflatable surface layer positioned above said longitudinally extending cells, said layer including a plurality of generally transversely extending cells, at least some of which cells are inflatable independently of others of said cells of said inflatable surface layer.

5,813,068
APPARATUS AND A PROCESS FOR WASHING CONTINUOUSLY WET-SPUN ELASTANE

Ulrich Reinehr; Günter Türck, both of Dormagen; Tilo Sehm, Düsseldorf; Wolfgang Anderheggen; Toni Herbertz, both of Dormagen, all of Germany, and Gino Antolini, Bergamo, Italy, assignors to Bayer Faser GmbH, Dormagen, Germany

Filed Dec. 15, 1995, Ser. No. 572,991
Claims priority, application Germany, Dec. 23, 1994, P 4446340.5
Int. Cl.[6] D06B *3/04*
U.S. Cl. 8—151.2 **10 Claims**



6. A process for washing elastane filaments from a continuous wet-spinning process using an apparatus comprising a wet-spinning unit having a precipitation bath **1** and a washing section consisting of at least one stripping unit **10** comprising a deflection

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roller 3, a squeezing roller 4 and a scraper 5, and a washing unit 11 comprising washing rollers 6, 8, a washing vat 9 and an additional squeezing roller 7, wherein the stripping unit 10 and the washing unit 11 are disposed in steps above the precipitation bath 1 of the wet-spinning device wherein freshly wet-spun elastane filaments are pulled off at a pull-off speed of at least 50 m/min and are substantially freed, on the stripping unit 10, from adhering water which is dragged out of the precipitation bath, wherein stripped-off water flows back into the precipitation bath, and are freed from at least 30% of the spinning solvent by multiple immersions in the washing liquid at a temperature of at least 90° C. in the subsequent washing unit 11, and optionally thence feeding the elastane filaments to a further after-treatment section.

5,813,069

MOTOR CONTROL METHOD FOR AUTOMATIC CLOTHES WASHER

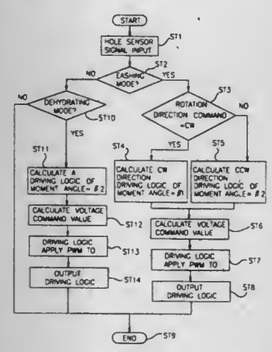
Hag Won Kim, Kyungki-Do, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

Filed Jan. 27, 1997, Ser. No. 791,435

Claims priority, application Rep. of Korea, Mar. 5, 1996, 5680/1996

Int. Cl.[6] D06F *33/02*

U.S. Cl. 8—159 **4 Claims**



1. A motor control method for an automatic clothes washer having an electronically commutated motor (ECM) serving as a power source, the ECM being serially connected to a washing axle and a drying axle without decreasing a spinning rate of the ECM, comprising the steps of:

judging, when a position of the ECM is sensed from a Hall sensor input, whether the automatic washer is set in a washing mode or in a drying mode;

determining a spinning direction command signal when the automatic washer is set in a washing mode;

calculating a driving logic at a specific moment angle applicable to a washing mode in the spinning direction command signal;

calculating a speed command signal in the ECM and a voltage command signal at a real speed value;

modulating a pulse width of the voltage command signal in accordance with the driving logic; and

outputting the pulse width modulated voltage command value.

5,813,070

CHORD SECTION ARRANGEMENT WITH LOWER CHORD WITH INTEGRATED GUIDE GROOVE OF A BRIDGE SECTION THAT CAN BE LAID MECHANICALLY

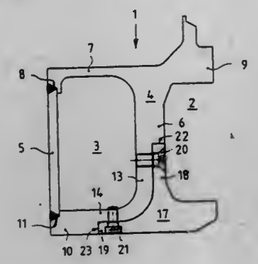
Helmut Dittrich, Ginsheim-Gustavsburg, Germany, assignor to Man Technologie AG, Augsburg, Germany

Filed Apr. 8, 1996, Ser. No. 629,374

Claims priority, application Germany, May 17, 1995, 295 08 133 U

Int. Cl.[6] E01D *15/133*

U.S. Cl. 14—2.4 **13 Claims**



1. A chord section arrangement of a bridge section made of light metal, the chord section comprising:

a thick-walled vertical web having a thick wall;

two chord sections connected to said vertical web, said two chord sections including a lower chord section with a thick wall; and

an element welded to said chord sections at right angles to said chord sections to define a hollow cross section which is closed in itself, said vertical web and said lower chord section having a thick-walled part wherein a portion of each thick-walled part of said vertical web and said lower chord section is removed by machining leaving residual wall portions having a thickness smaller than said vertical web thick wall and smaller than said lower chord thick wall, said residual wall portions extending in two planes arranged at right angles to one another over a length area and defining a remaining vertical web portion with said thick wall and a remaining lower chord portion with said thick wall;

a T-shaped insert including two legs; and

connection means for connecting said two legs to said residual wall thicknesses in a dimensionally stable manner between said remaining vertical web portion with said thick wall and a remaining lower chord portion with said thick wall.

5,813,071

TELESCOPING TRUCK LOADING RAMP ASSEMBLY

Patrick William Breslin, Wickenburg, and Mark V. Shoen, Mesa, both of Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

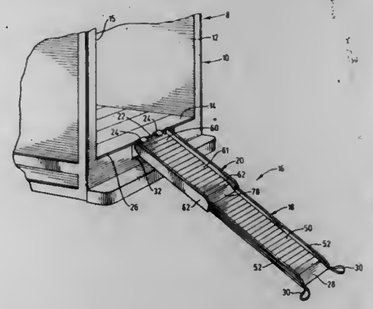
Filed Feb. 8, 1994, Ser. No. 193,563

Int. Cl.[6] E01D *1/00*

U.S. Cl. 14—71.1 **9 Claims**

1. A ramp assembly stowable within the confines of the spaced apart, longitudinal frame members of the chassis of a truck without interference with the differential housing of the truck, said truck including a body carried by said chassis, said truck body defining a cargo space having a rear door opening, the ramp assembly comprising:

a pair of elongated ramp sections of substantially equal length and comprising (a) a forward section having front and rear end portions, longitudinal side rails and a ramp floor attached to and extending between the side rails and (b) a rearward section having front and rear end portions, side rails and a ramp floor extending between the side rails of the rearward section, the side rails of one of the ramp sections comprising



longitudinally extending sleeves each defining an interior trackway for receiving one of the side rails of the other ramp section, the other ramp section being thereby adapted to be received within the confines of the one ramp section in overlapping, telescoping fashion with the ramp floor of the one ramp section being above the ramp floor of the other ramp section, the ramp sections being movable relative to each other between a collapsed, stowed configuration of the ramp assembly in which the other ramp section is substantially completely disposed within the confines of the one ramp section, and a fully extended, operating configuration of the ramp assembly in which only the rear end portion of the one ramp section and the front end portion of the other ramp section are in overlapping, telescopic relationship; and

means mounted on the front end portion of the one ramp section for pivotably attaching said end portion to the truck body at the door opening adjacent the rear of the cargo space.

5,813,072

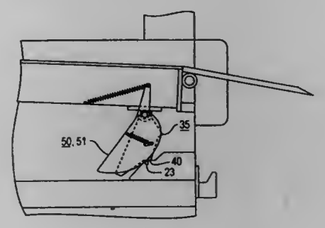
AUTOMATIC SAFETY LEGS FOR DOCK LEVELER

James C. Alexander, London, Canada, assignor to United Dominion Ind., Inc., Charlotte, N.C.

Filed Nov. 27, 1996, Ser. No. 757,945

Int. Cl.[6] E01D *1/00*

U.S. Cl. 14—71.1 **20 Claims**



11. A safety leg assembly for a dock leveler having a pivotally mounted deck, said safety leg assembly comprising:

at least one safety leg pivotally mounted to an underside of said deck and biased into an extended position, said at least one safety leg having multiple support surfaces;

cam means for permitting said safety leg to remain extended as said deck moves downward in a first condition and for progressively retracting said safety leg as said deck moves downward in a second condition but permitting said one safety leg to subsequently limit downward travel of said deck if said deck subsequently moves in said first condition after said safety leg has started to retract;

a member adapted to contact said cam means to move said cam means while not retracting said safety leg whenever said deck moves downward in said first condition, thereby allowing said safety leg to remain extended and limit downward travel of said dock leveler as one of said support surfaces contacts said member.

5,813,073

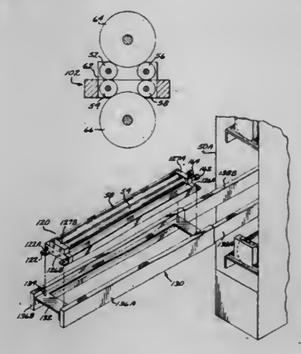
SHEET CLEANING APPARATUS WITH CARTRIDGE ROLLER ASSEMBLY

John A. Korbonski, San Juan Capistrano, Calif., assignor to Systems Division Incorporated, Irvine, Calif.

Filed Sep. 26, 1996, Ser. No. 722,857

Int. Cl.[6] B08B *11/00*

U.S. Cl. 15—3 **16 Claims**



1. A sheet cleaning apparatus for cleaning foreign particles from at least one surface of a sheet, comprising:

a frame;

a removable sheet cleaning roller cartridge assembly including at least one sheet cleaning roller rotatably secured thereto for rotation about a sheet cleaning roller axis, said roller comprising a layer of resilient material defining a peripheral roller surface with a high surface tack adapted to transfer foreign particles from said sheet to said peripheral roller surface upon contact and subsequent separation therebetween while affording clean separation between the sheet and said peripheral surface;

a roller cleaning member having a contact surface with a greater surface tack with respect to said foreign particles than said sheet cleaning roller surface, said contact surface adapted to transfer said foreign particles from said peripheral surface of said cleaning roller to said contact surface of said roller cleaning member during sheet cleaning operations, said roller cleaning member having an external surface defining said contact surface and a cleaning element axis arranged substantially parallel to said roller axis;

mounting apparatus for mounting said roller cartridge assembly in relation to said frame, said mounting apparatus permitting ready removal and replacement of said roller cartridge assembly with another roller cartridge assembly to minimize down time of said sheet cleaning apparatus while permitting off-line servicing of said removed roller cartridge assembly.

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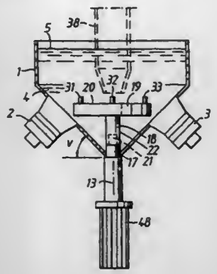
5,813,074
APPARATUS FOR CLEANING THE HEADS OF WELDING ROBOTS

Christer Liljeholm, P.O. Box 16, S-733 21 Sala, Sweden

PCT No. PCT/SE95/00732, § 371 Date Dec. 17, 1996, § 102(e) Date Dec. 17, 1996, PCT Pub. No. WO95/35182, PCT Pub. Date Dec. 28, 1995
PCT Filed Jun. 15, 1995, Ser. No. 750,476
Claims priority, application Sweden, Jun. 17, 1994, 9402134
Int. Cl.[6] B08B *3/12*
U.S. Cl. 15—21.1 9 Claims

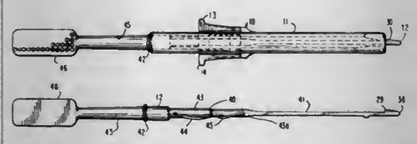


1. Apparatus for cleaning the heads of electrical welding robots, wherein the heads include a gas casing and an electrical contact nozzle, said apparatus comprising: an open vessel having a longitudinal axis and which includes means for generating ultrasonic waves in a liquid contained in the vessel, a rotary device within the vessel and located beneath an upper surface of the liquid, wherein the vessel is conical in shape and includes a cone apex that faces downwards and is defined by a plurality of flat sidepieces, wherein the means for generating ultrasonic waves include an ultrasonic generator mounted on each of at least three of the flat sidepieces for generating ultrasonic waves in said liquid; and wherein normals extending inwardly from each respective ultrasonic generator coincide at a point on the longitudinal axis of the vessel located beneath the upper surface of said liquid.

5,813,075
TOOTHBRUSH HAVING BI-DIRECTIONAL ROTATIONAL HEAD

Walter Graur, 387 Jefferson St., Brooklyn, N.Y. 11237

Filed Nov. 7, 1996, Ser. No. 744,968
Int. Cl.[6] A46B *13/08*
U.S. Cl. 15—22.1 5 Claims

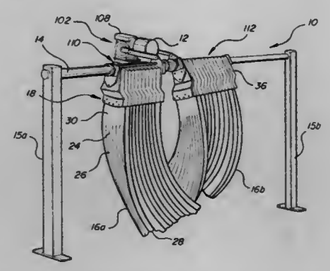


1. A toothbrush comprising: a supporting shaft having a principal axis, a handle enclosing said shaft, said shaft having a bristled end thereon; said handle defining a cylindrical bore therein, said shaft being at least partially disposed within said bore and having a first end fixed to said handle at an end of said bore; a portion of said shaft disposed within said bore forming a torsion bar; a second portion of said shaft having at least one spiral track means; at least one manually operated slide carried by said handle selectively engaging said at least one of said track means for imparting rotational motion to said shaft in response to movement imparted to said slide parallel to said axis of said shaft; whereby, upon release of said slide, said torsion bar returns said shaft to a neutral position.

5,813,076
CURTAIN-STYLE VEHICLE LAUNDRY DEVICE

Michael J. Belanger, Novi, and Robert J. Wentworth, Farmington Hills, both of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed Apr. 29, 1996, Ser. No. 641,115
Int. Cl.[6] B60S *3/04*
U.S. Cl. 15—97.3 23 Claims



1. A laundering implement for cleaning an external surface of a vehicle comprising:

a plurality of elongate, replaceable elements for a cloth-type vehicle laundry, each element made of a fabric and having opposite, substantially parallel, substantially planar faces, and engageable with an external surface of a vehicle, and mounting means defined by at least one aperture formed through each element;

a plurality of stackable spacers, said elements being interposed between said spacers in stacked relationship; and

anchor means supported by said spacers and passing through said at least one aperture of each said element for anchoring each element with respect to said adjacent stacked spacers.

5,813,077
SPHERICAL BEARING ARRANGEMENT FOR VEHICLE LAUNDRY BRUSH

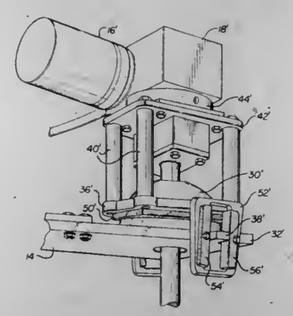
Michael J. Belanger, Novi, and Robert J. Wentworth, Farmington Hills, both of Mich., assignors to Belanger, Inc., Northville, Mich.

Continuation-in-part of Ser. No. 641,116, Apr. 29, 1996, Pat. No. 5,709,002. This application Apr. 28, 1997, Ser. No. 848,504
Int. Cl.[6] B60S *3/06*
U.S. Cl. 15—97.3 17 Claims

1. For use in combination with a surface treatment implement of the type having a drive shaft extending in a generally vertical direction and a surface contacting implement carried thereon, a support apparatus comprising:

a hemi-spherical bearing;

a seat cooperating with said bearing for providing relative universal pivoting movement between the bearing and seat; and

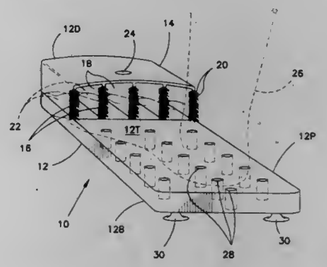


means for mounting said shaft and implement in depending relation to said seat, such that said shaft passes freely through said bearing.

5,813,078
SHOWER FOOT WASHER

Nicholas Shawyer Hogan, Sr., 413 N. Broadacres, Compton, Calif. 90220

Filed Aug. 20, 1997, Ser. No. 915,457
Int. Cl.[6] A47K *7/02*
U.S. Cl. 15—160 1 Claim



1. A shower foot washer, for use in a shower stall or bathtub, comprising:

a platform, having a proximal portion, a distal portion, a top surface, and a bottom surface;

a casement extending upward from the top surface, along the distal portion, of the platform, the casement further including a top wall spaced above the top surface of the platform and extending across the distal portion thereof;

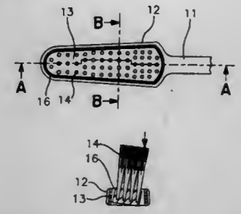
a plurality of vertical partitions, each partition extending from the top wall of the casement to the top surface of the platform, thereby creating segmented portions in the casement adapted to receive therein the toes of the user's foot; and

brush extensions protruding from each of the vertical partitions for cleaning the user's toes as well as the areas therebetween.

5,813,079
TOOTHBRUSH HAVING A FLEXIBILITY LINKED ZONE IN ITS HEAD

Hans Halm, Herne, Germany, assignor to Lingner & Fischer GmbH, Buehl, Germany

Continuation of Ser. No. 483,484, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 122,407, Sep. 27, 1993, abandoned. This application Sep. 12, 1996, Ser. No. 712,780
Claims priority, application United Kingdom, Mar. 27, 1991, 9106493; Dec. 12, 1991, 9126380
Int. Cl.[6] A46B *9/04*
U.S. Cl. 15—167.1 3 Claims



1. A toothbrush comprising a handle and a head both made of plastic material, the handle having an end disposed toward the head;

the head comprising a frame integrally formed with the handle and extending from the end of the handle;

a portion being made of plastic material and located within and completely surrounded by the frame;

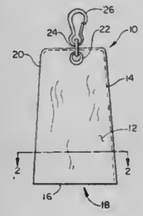
being distributed on the portion and having ends proximal to the portion fixed therein such that said proximal ends do not move relative to the portion during use of the toothbrush in tooth brushing;

the relative dimensions of the frame and portion being such as to leave an open space between the plastic material of the frame and the plastic material of the portion; the open space containing a flexible and resilient elastomeric material which links the frame and the portion such that the portion is flexibly and resiliently linked to the frame and is capable of rocking motion relative to the frame.

5,813,080
TOWEL STRUCTURE

Ronald Hendren, Minnetonka, Minn., assignor to Universal Technologies, Inc., Minnetonka, Minn.

Filed Aug. 1, 1996, Ser. No. 691,131
Int. Cl.[6] A47L *13/12*; A47K *7/02*
U.S. Cl. 15—209.1 22 Claims



1. A towel structure comprising:

a towel member formed in a first sleeve structure, said towel member having a first absorbency relative to water and having first and second ends;

a wiping member formed as a second sleeve structure having a second absorbency different from said first absorbency, and being substantially encompassed by said towel member;

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a film member interposed between said towel member and said wiping member to substantially inhibit transfer of said water from said towel member to said wiping member; and

a fastening mechanism fastening said towel member, said wiping member and said film member together.

5,813,081

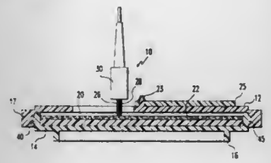
CIRCULAR DEVICE FOR CLEANING THE ENDS OF OPTICAL FIBERS

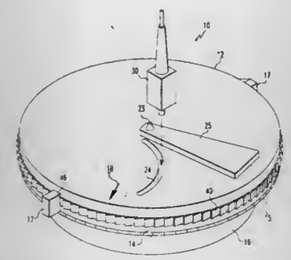
Bo Wang, Greer, S.C., and Ronald Peek, Pleasanton, Calif., assignors to Alcoa Fujikura Limited, Brentwood, Tenn.

Filed Apr. 4, 1997, Ser. No. 833,361

Int. Cl.[6] B24B *13/00*

U.S. Cl. 15—210.1 **5 Claims**





1. A device for cleaning an end surface of an optical fiber, comprising:

a circular container containing a circular pad of resilient elastomer material and a circular layer of cleaning material located on the elastomer material, said layer of cleaning material having a surface capable of cleaning an exposed end of an optical fiber when the fiber end surface is rubbed against the surface of the layer of cleaning material,

said container including a base and a cover that are relatively manually rotatable when connected together; and

said cover having an opening for receiving a fiber end for engaging the surface of the layer of cleaning material.

5,813,082

PAD AND ROLLER ASSEMBLY FOR CLEANING SEMICONDUCTOR WAFERS

Leonard C. Stevens, Jr., Poughquag, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

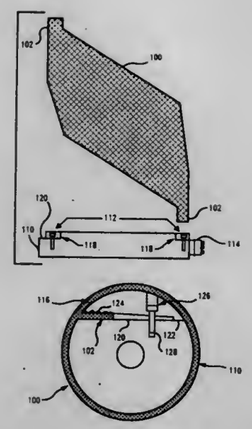
Filed Jul. 24, 1996, Ser. No. 686,048

Int. Cl.[6] A47L *25/00*

U.S. Cl. 15—230.13 **14 Claims**

1. A cleaning pad and roller assembly for cleaning semiconductor wafers comprising:

a roller means; and



a pad, said pad being clamped and wrapped around said roller means in helix-like fashion with no overlap of said pad and, wherein edges of said pad create a gap to form said cleaning pad and roller assembly.

5,813,083

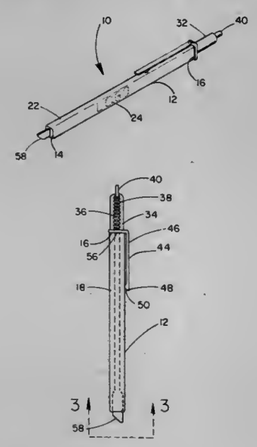
EASY SCRATCH PEN TOOL

Clarence F. Gould, 49 Gerald Avenue, Truro, Nova Scotia, Canada, B2N 5N6

Filed Dec. 15, 1997, Ser. No. 990,230

Int. Cl.[6] A47L *13/02*

U.S. Cl. 15—236.01 **6 Claims**



2. An easy scratch pen tool comprising:

an elongated housing member having an interior hollow extending a length thereof, and having a slot for providing an entry into the hollow;

a cap member being mounted to the housing member, the cap member having a cap hollow for positioning of a button rod with a coiled spring therein, the button rod having a button tip projecting outwardly from the cap member; and

an elongated scratcher member having a flat end and a scratcher tip, the flat end of the scratcher member being in communication with and extending to the button rod of the cap member.

5,813,084

GOLF CLUB FACE CLEANER

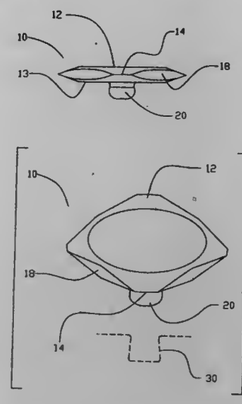
Todd Hadaway, 9239 Avon Belden Rd., North Ridgeville, Ohio 44035

Continuation of Ser. No. 612,997, Mar. 8, 1996, abandoned.

This application Oct. 10, 1997, Ser. No. 948,441

Int. Cl.[6] A47L *13/02*; **A63B** *57/00*

U.S. Cl. 15—236.05 **10 Claims**



1. A golf club face cleaner for cleaning the grooves in golf club faces comprising a polygonal body having a top surface, a bottom surface and an outer peripheral surface extending entirely around a periphery of the polygonal body defining a boundary of said polygonal body, said outer peripheral surface comprised of a plurality of tapered cleaning edges adapted to fit into and clean a groove in the face of a golf club and a plurality of sidewalls, each of said sidewalls being located between respective pairs of tapered cleaning edges and having a thickness that decreases from a central portion toward opposite ends of said sidewall such that the thickness at the ends of said sidewall is substantially equal to a thickness of the tapered cleaning edges.

5,813,085

MOTOR ISOLATION GASKET FOR CENTRAL VACUUM

Joel Fritz, and Steven Lauritsen, both of Webster City, Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 25, 1997, Ser. No. 810,146

Int. Cl.[6] A47L *5/38*

U.S. Cl. 15—314 **20 Claims**

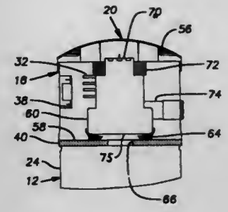
1. A central-vacuum power unit comprising:

a canister forming a hollow interior;

a plate within said canister and dividing said hollow interior into first and second chambers, said plate having an opening;

a vacuum motor vertically extending within said first chamber and having an inlet in fluid communication with said second chamber through said opening of said plate, said vacuum motor having an end surface generally facing said plate; and

a gasket-encircling said opening and said inlet and sealing said motor to said plate, said gasket including a ring-shaped main wall, a flexible seat extending from said main wall toward and



supporting said vacuum motor, and a protrusion extending from said main wall toward and engaging said end surface of said vacuum motor to form a seal therebetween, wherein said protrusion is located radially inward and spaced apart from said seat, wherein said gasket is molded of a rubber compound having a durometer of about 45.

5,813,086

CARPET CLEANER AND METHOD FOR CLEANING CARPETS

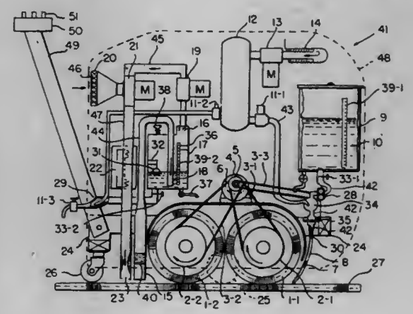
Saburo Ueno; Sumio Morikawa, and Hiroyuki Satone, all of Osaka, Japan, assignors to Oyodo Komatsu Co., Ltd, and Sun Food Laboratory Inc., both of Japan

Filed Jan. 11, 1996, Ser. No. 584,837

Claims priority, application Japan, Oct. 23, 1995, 7-318657

Int. Cl.[6] A47L *11/284*

U.S. Cl. 15—320 **18 Claims**



1. A cleaning device comprising:

means for movably supporting said cleaning device;

said cleaning device being movable in a direction of travel by said means for movably supporting;

means for applying a cleaning agent to a surface;

said means for applying a cleaning agent includes

means for transforming said cleaning agent into a foam;

means for applying said foam to said surface;

means for scrubbing said foam into said surface;

said means for scrubbing having brushes movably mounted on said chassis such that said brushes contact said surface;

means for moving said brushes relative to said surface;

said means for moving said brushes includes means for rotating said brushes;

said means for rotating being effective to rotate said brushes in opposing directions;

means for removing said foam from said surface;

said means for removing mounted on said cleaning device behind said means for scrubbing relative to said direction of travel;

means for drying said surface;

said means for drying including means for blowing air on said surface; and

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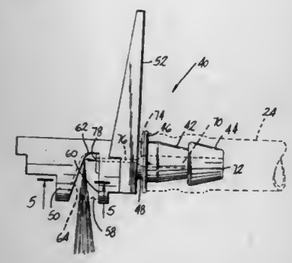
said means for drying mounted behind said means for removing relative to said direction of travel.

5,813,087
SPRAY NOZZLE FOR USE WITH WATER EXTRACTION CLEANING MACHINE
Eric C. Huffman, Lowell, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed Apr. 22, 1996, Ser. No. 635,557
Int. Cl.[6] A47L *7/00*
U.S. Cl. 15—321 **18 Claims**



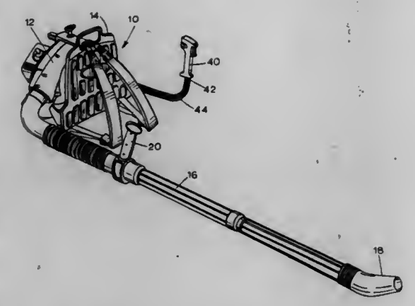
1. An improved spray nozzle adapted to receive fluid under pressure from a suitable source and distribute the fluid in a desired spray pattern. The nozzle comprising a nozzle body having a bore therethrough with an inlet opening and an outlet opening forming a flow path; a deflector surface in spaced, confronting relationship with the outlet opening for deflecting a fluid stream under pressure from the outlet opening into a spray pattern on a surface to be cleaned, the deflector surface comprising a first side edge, second side edge, and an intermediate portion being disposed between the first and second side edges and the deflector surface is concave toward the bore outlet opening: a spray opening beneath the bore outlet and adjacent the deflector surface for passage of liquid in a spray pattern deflected from the deflector surface; and the improvement comprising:

the first and second side edges are laterally positioned closer to the plane of the outlet opening than the intermediate portion to thereby focus the spray pattern on a work surface.

5,813,088
BACKPACK BLOWER
Jeffrey F. Wagner, 6460 N. Montrose Dive, Tucson, Ariz. 85741; Kerry D. Roosmalen, 8983 N. Veridian Dr., Tucson, Ariz. 85743; Darren K. Riley, 1170 N. Reta Dr., Vail, Ariz. 85641; Michael S. Despain, 9583 E. Dunnigan Dr., Tucson, Ariz. 85747, and Gary T. Johnson, 1140 E. Canada Vista Pl., Tucson, Ariz. 85737
Filed Jul. 23, 1997, Ser. No. 898,965
Int. Cl.[6] A47L *9/32*
U.S. Cl. 15—327.5 **10 Claims**

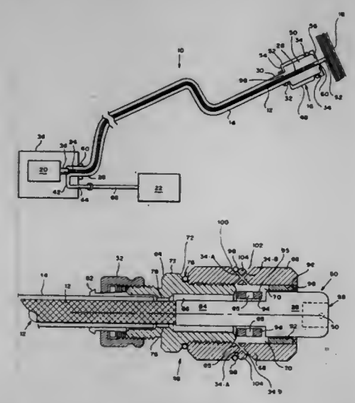
1. A backpack blower, comprising:

a motorized blower unit; and



a control handle mounted on a flexible arm and operable to control the motorized blower unit, wherein the flexible arm retains its shape upon being moved to a desired position.

5,813,089
DUCT CLEANING APPARATUS
James R. Nolan, Aurora, Ill., and Gary E. Kruse, Lawrenceville, Ga., assignors to Abatement Technologies, Inc., Lawrenceville, Ga.
Filed Oct. 15, 1996, Ser. No. 732,771
Int. Cl.[6] A47L *5/12;9/02*
U.S. Cl. 15—383 **15 Claims**



14. An apparatus for cleaning an interior surface of a structure, comprising

a) an elongated flexible casing having a proximal end and a distal end;

b) means for forcing a fluid through the casing to the distal end of the casing; and

c) a fluid directing assembly connected to the distal end of the casing, the fluid directing assembly comprising

(i) a housing having an outer surface and an internal passage in fluid communication with the casing;

(ii) a first plurality of nozzles extending between the internal passage and the outer surface of the housing in a first direction,

(iii) a second plurality of nozzles extending between the internal passage and the outer surface of the housing in a second general direction, different from the first general direction; and

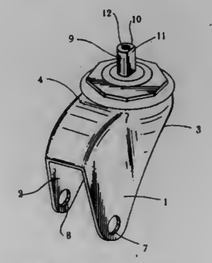
(iv) means for selectively closing the first plurality of nozzles when the second plurality of nozzles is open and for closing the second plurality of nozzles when the first plurality of nozzles is open;

the apparatus further comprising a cleaning tool connected to the fluid-directing assembly; and means for spinning the cleaning tool.

15. The apparatus of claim 14 wherein the means for selectively closing the first plurality of nozzles when the second plurality of nozzles is open and for closing the second plurality of nozzles when the first plurality of nozzles is open comprises an O-ring adapted to fit around the outer surface of the housing, selectively covering either the first or second plurality of nozzles; and

wherein the outer surface of the housing defines a first detent groove around the periphery of the housing for holding the O-ring in position over the first plurality of nozzles and a second detent groove around the periphery of the housing for holding the O-ring in position over the second plurality of nozzles.

5,813,090
CASTER WITH D-SHAPED STEM
Joseph J. Miles, Plant City, Fla., assignor to United Auto Systems Inc., Tampa, Fla.
Filed Jan. 22, 1997, Ser. No. 787,586
Int. Cl.[6] B60B *33/00*
U.S. Cl. 16—37 **9 Claims**



1. A caster comprising:

a wheel having a central hub;

a yoke comprising a generally horizontal base and first and second forks depending from the base;

an axle extending through said first fork, said wheel hub, and said second fork, and defining an axis of rotation for said wheel such that said wheel is mounted on said axle for rotation between said first and second forks;

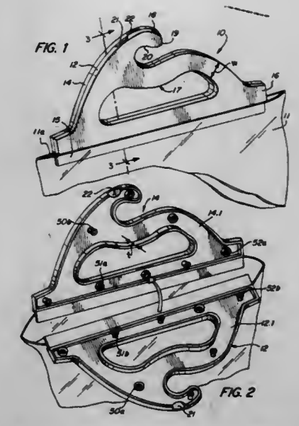
a stem extending upwards from said base and defining a stem axis, said base mounted on said stem for rotation about said stem axis;

wherein at least the upper end of said stem has a generally cylindrical outer circumference, an internal threading, and an inner circumference defined by said internal threading,

and wherein said stem includes a generally planar surface defined by a chord intersecting said outer circumference but not crossing through said inner circumference, such that said stem has a "D" shaped cross section.

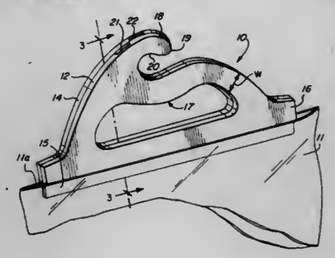
5,813,091
SAFETY DEVICE FOR A DOOR
Bernard Chaumat, 10, boulevard Jourdan, 75014 Paris, France
Filed Mar. 25, 1997, Ser. No. 827,004
Int. Cl.[6] E05F *5/02*
U.S. Cl. 16—82 **7 Claims**

1. A safety device for automatically preventing a door from accidentally closing completely, the door comprising at least one



panel provided with an actuator member and hinged in a doorframe, the safety device comprising a movable member displaceable between a safety position in which it prevents the door from closing completely and a closure position in which the door can be closed, said movable member being located at a top edge of the hinged panel of the door, and said movable member, in its safety position, extending beyond the top edge of the hinged panel such that it cooperates with one of the doorframe and an element secured to said doorframe to prevent the door closing completely, and in its closure position, lies beneath the top edge of the hinged panel so that the door can be closed, said movable member being connected to said actuator member in such a manner that actuating the actuator member displaces said movable member towards its closure position.

5,813,092
HANGER HANDLE FOR A RECLOSEABLE BAG
Ronald J. Greenfield, Melville; Richard F. Schneider, Oakdale, both of N.Y.; Audrey M. Harper, and Morton Schindel, both of Weston, Conn., assignors to Monaco, LLC, Bethel, Conn.
Filed Feb. 14, 1996, Ser. No. 601,226
Int. Cl.[6] B65D *33/24*
U.S. Cl. 16—110 R **2 Claims**



1. A hanger handle for a recloseable bag, comprising:

a first and a second complementary sized and shaped flexible side members, the side members being shaped so as to fit together to form a single, matched handle, and wherein

each side member comprises a bottom edge strip to which the bag is attached and a grip portion upwardly extending from the base portion, the grip portion comprises a closed curvilinear loop which defines a grip space, wherein the closed curvilinear space predominantly assumes the shape of an inverted, squat W;

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the grip portion further comprises an arm extending from a first end thereof, said arm being shaped so as to form a hook portion which extends over a midpoint of the grip portion; and

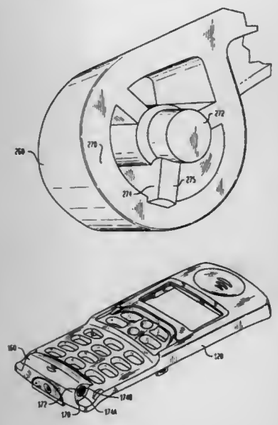
each of the side members having a plurality of distributed complementary interfitting male and female fastening elements disposed thereon,

said arms having peripheral edges laterally projecting from a surface of the arms with segments of the peripheral edges removed so as to form respectively offset recesses located in the grip portion and sized to enable one to conveniently insert tips of fingers from opposite hands to pry the arms from each other to separate the interfitted fastener elements and the side members to open the bag.

5,813,093
HINGE ASSEMBLY

Joseph James Giordano, Jr., Belle Mead; James R. Graham, Bedminster; William Vincent Jackwicz, Spring Lake Heights; Pratod V. Kasbekar, Manalapan; Harish Shankar Mangrulkar, Colonia, and Romano M. Zambon, Sea Bright, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 31, 1997, Ser. No. 792,305
Int. Cl.[6] E05D *11/10*
U.S. Cl. 16—329 **10 Claims**



1. A hinge assembly comprising:

a first part including a pair of spaced arms having a common axis;

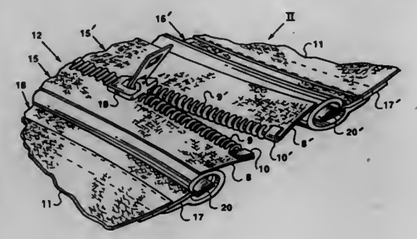
a second part including an intermediate portion that is straddled by and captured between the arms of the first part in a manner that permits the first and second parts to rotate relative to one another about the common axis of the arms, the positioning of the intermediate portion between the spaced arms of the first part causing the arms to be biased toward the intermediate portion;

the arms and the intermediate portion having opposed facing surfaces in close proximity to one another, at least one of the facing surfaces having a protrusion, and the facing surface opposed to the protrusion having both a recess for accommodating the protrusion and a ramp adjacent to the recess whereby when the protrusion is positioned on the ramp, the interaction between the protrusion and the ramp results in the rotation of the first and second parts of the hinge assembly relative to one another so as to move the protrusion into the recess.

5,813,094
DEVICE FOR REPAIRING AN ARTICLE HAVING AN INOPERABLE SLIDABLE FASTENER OR STRINGER

Raul Marquez Perez, II, 2610 E. Sylvia, Phoenix, Ariz. 85032

Filed Mar. 25, 1997, Ser. No. 826,348
Int. Cl.[6] A44B *19/00*
U.S. Cl. 24—381 **20 Claims**



1. A device for use in repairing an article with an inoperable slidable fastener, comprising:

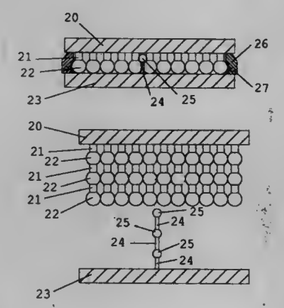
a channel member having an upper edge and a lower edge defining a narrow longitudinal opening, wherein said opening is adapted to receive and hold a workpiece stringer; and

a stringer having an outer tape portion, said outer tape portion of said stringer affixed to said channel member.

5,813,095
RE-CLOSABLE SURFACE BINDING METHOD

Thomas Wilson Robertson, 3 Swift La., Merrimack, N.H. 03054

Filed Dec. 9, 1996, Ser. No. 762,797
Int. Cl.[6] A44B *18/00*
U.S. Cl. 24—442 **20 Claims**



1. A reusable binding system for binding two articles, comprising:

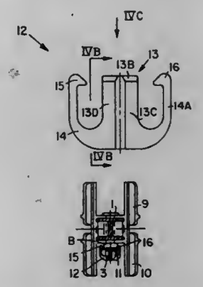
a first said article, at least one surface of which is configured with a multiplicity of bulbous element shafts terminating in a planar array of bulbous elements of substantially uniform size, each said bulbous element tangentially contacting an adjacent said bulbous element,

a second said article, at least one surface of which is configured with at least one striker pin post terminating in a striker pin head, the diameter of said pin head being larger than the space between adjacent said bulbous elements, further comprising means for restraining the relative position of said bulbous elements.

5,813,096
SNAP FASTENER WITH A SAFETY LOCK

Haus-Ketel Soennichsen, Jork, Germany, assignor to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

Filed Jan. 24, 1997, Ser. No. 798,181
Claims priority, application Germany, Jan. 26, 1996, 196 02 828.0
Int. Cl.[6] A44B *17/00;* **F16B** *21/00*
U.S. Cl. 24—573.1 **9 Claims**



1. A snap fastener with a safety lock, comprising in combination a fastener section (1), a washer (8), and a locking bail (12), said fastener section (1) comprising a head (2), a stem (S) secured to said head (2), at least one slot (6) in said stem opposite said head and at least two snap-on members having shoulders (4) separated by said slot (6) opposite said head, said washer (8) having a central hole through which said snap-on members fit when a said snap-on members are elastically pressed toward each other across said slot (6), said locking bail (12) comprising a center portion (13) fitting into said slot (6) to keep said locking shoulders rigidly spaced from each other when said washer (8) is in place, said locking bail (12) further comprising at least one elastically bendable locking hook (15 or 16) for holding said locking bail in place in said slot, thereby keeping said shoulders (4) of said snap-on members engaged.

5,813,097
DUAL TONGUE BUCKLE WITH INDEPENDENT LATCHING

Thomas P. Woellert, Indianapolis, and Michael A. Wiseman, Avon, both of Ind., assignors to Indiana Mills and Manufacturing, Inc., Westfield, Ind.

Filed Dec. 23, 1996, Ser. No. 771,953
Int. Cl.[6] A44B *11/00*
U.S. Cl. 24—631 **20 Claims**

1. A belt buckle-tongue combination comprising:

a housing having a cavity therein;

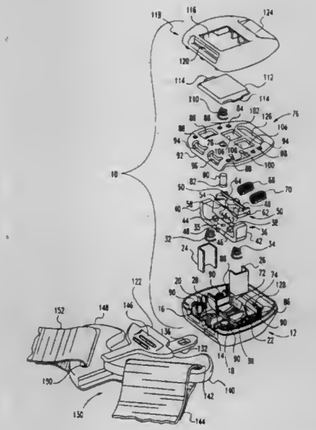
a cover mounted to said housing over said cavity;

a single latch member positioned in said cavity and moveable therein;

a plurality of tongue members each receivable within said cavity and latchable to corresponding portions of said single latch member independently of latching of remaining ones of said plurality of tongue members;

a release member extending through said cover and operable to force said single latch member away from said cover to thereby unlatch any of said plurality of tongue members latched to said single latch member; and

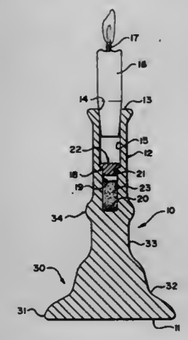
an ejection member positioned within said cavity and responsive to movement of said single latch member away from said cover to at least partially eject from said cavity each of said tongue members unlatched from said single latch member via said release member.



5,813,098
MEMORIAL CANDLESTICK

Anthony J. Schneider, Box 32, Pense, Saskatchewan, Canada, S0G 3W0

Filed Oct. 7, 1996, Ser. No. 726,985
Int. Cl.[6] A61G *17/08*
U.S. Cl. 27—1 **6 Claims**



1. A candlestick comprising:

a base portion having a horizontal bottom surface for resting on a support surface;

a support portion carried by the base portion and standing upwardly therefrom;

the base portion being shaped so as to converge upwardly and inwardly from a base band at the bottom surface to define a neck section narrower in width than the base band above the base band;

the support portion being located above the neck section and having a width less than that of the base band;

the support portion defining a horizontal upper surface and a vertical generally cylindrical bore of substantially constant diameter within the support portion extending to an opening in the upper surface;

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a candle projecting into the vertical bore and located by engagement with the vertical bore so as to stand vertically upwardly from the upper surface;

a receptacle in the candlestick defined by a counterbore at a base of the vertical bore which is smaller in diameter than the vertical bore with a filler opening and a plug member for closing the filler opening underneath the candle.

5,813,099

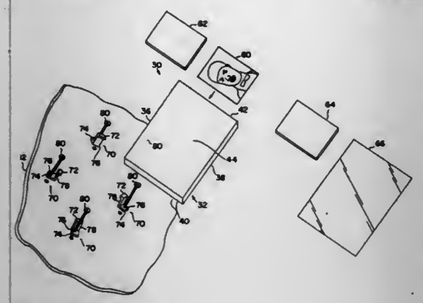
BURIAL CASKET WITH PHOTOGRAPHIC MEMORIAL MARKER

Glenn A. Stewart, 2308 Broadway Ave., Alexandria, La. 71301

Filed May 2, 1997, Ser. No. 850,084

Int. Cl.[6] A61G *17/00*

U.S. Cl. 27—2 **18 Claims**



1. A casket including:

a front wall member;

a back wall member aligned with and spaced from the front wall member;

a first side wall member aligned to engage one end of the front and back wall members;

a second side wall member aligned to engage another end of the front and back wall members;

a bottom wall member aligned to engage bottom portions of the front and back and first and second side wall members;

a top wall member having outermost portions thereof aligned with and coupled to the back wall member;

a first coupling means for coupling the front, back, side and bottom wall members together to form an enclosure having an opening formed therein;

a second coupling means for pivotably coupling adjacent portions of the top wall member to the back wall member so that the top wall member can be selectively moved to cover the opening in the enclosure;

a pictorial identification member supportable adjacent an outside wall of the front wall member;

a first cover member coupled to a bottom portion of the pictorial identification member for providing a protective cover for the bottom portion of the pictorial identification member;

a second cover member coupled to a top portion of the pictorial identification member for providing a protective cover for the top portion of the pictorial identification member;

a support member for supporting the pictorial identification member adjacent to the outside wall of the front wall member;

a third coupling member for coupling the pictorial identification member to the support member;

a sealing member for sealing the cover member and the support member so that the pictorial identification member is protected from moisture and so that a harden durable surface is formed; and

a fourth plurality of coupling members, each coupling member having first portions which engage selected portions of the support member and second portions which engage selected portions of the wall member, for coupling the support members adjacent the front wall member.

5,813,100

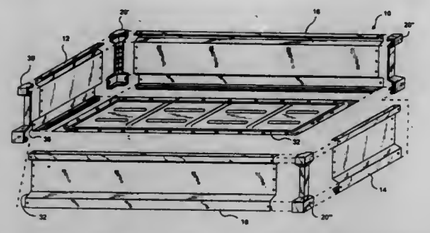
CASKET ASSEMBLY FROM PRE-FINISHED PARTS

William T. Mackirdy, Scott Run, Pa., assignor to Casket Shells Incorporated, Eynon, Pa.

Filed Mar. 28, 1997, Ser. No. 827,256

Int. Cl.[6] A61G *17/007*

U.S. Cl. 27—6 **8 Claims**



1. A metal casket shell formed from parts that are pre-painted and pre-finished without the need for welding and grinding joints and covers and without destroying the outside surface of the casket to thereby eliminate the need to paint and finish a casket shell in a separate operation, the casket shell having casket ends, casket sides, a bottom and a lid, the ends and sides, each having terminal ends and being joined at a corner, at least one corner having a corner connector, and means for connecting a side and end to the connector, the corner connector including a top part, bottom part and central stem, a first slot in the connector's top part, bottom part and central stem corresponding in shape to the terminal end of the casket side and a second slot in the connector's top part, bottom part and central stem corresponding in shape to the terminal end of the casket end, the terminal end of the casket side being received and fastened in the first slot, and the terminal end of the casket end being received and fastened in the second slot.

5,813,101

DEVICE FOR NEEDLING A PREBONDED WEB

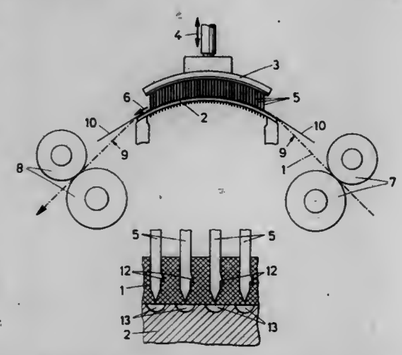
Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

Filed Apr. 10, 1997, Ser. No. 843,674

Claims priority, application Austria, Apr. 19, 1996, 711/96; Apr. 29, 1996, 766/96

Int. Cl.[6] D04H *18/00*

U.S. Cl. 28—114 **5 Claims**



1. A device for needling a prebonded web, which comprises

(a) a feed roller feeding the web at a feed rate in a direction of web movement,

(b) a stationary web support having a continuous convex curvature in the direction of web movement,

(c) a needle board reciprocatingly movable in a needling direction towards and away from the stationary web support, the needle board being disposed directly opposite the web support, and

(d) a discharge roller withdrawing the web at a withdrawal rate exceeding the feed rate, the web support being disposed between the feed roller and the discharge roller.

5,813,102

PROCESS FOR PRODUCING A TAMPON HAVING DENSIFIED, SOLID, FIBROUS CORE

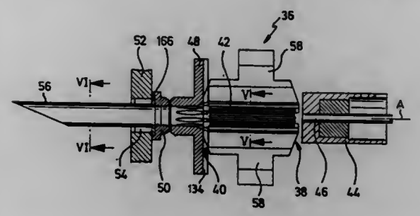
Robert Leutwyler, Boppelsen, Switzerland, and Hans Werner Schoelling, Ennepetal, Germany, assignors to McNeil-PPC, Inc., Skillman, N.J.

Division of Ser. No. 725,838, Sep. 30, 1996, abandoned, which is a continuation of Ser. No. 196,664, Feb. 15, 1994, abandoned. This application May 9, 1997, Ser. No. 853,624

Claims priority, application Germany, May 15, 1993, 43 04 505.7

Int. Cl.[6] A61F *13/20*

U.S. Cl. 28—118 **6 Claims**



1. A process for producing a tampon having an insertion end and a withdrawal end, the process comprising the steps of:

winding up a length of a continuous fibrous web to form a generally cylindrical tampon blank having a circumferential surface;

simultaneously pressing spatially separate, narrow, strip-shaped portions of the circumferential surface of the tampon blank radially inward in a simultaneous manner to form a plurality of longitudinal grooves separated by relatively uncompressed longitudinal ribs which extend radially outward from a relatively compressed core, wherein the core is compressed to a lesser extent proximate the withdrawal end of the tampon than other portions of the tampon core; and

pressing outer ends of the longitudinal ribs radially inward to form a soft, smooth, circumferential surface, while maintaining the relatively uncompressed fibrous structure of the ribs.

5,813,103

CROSS-TIE PRE-PLATING SYSTEM

Gerald David Girouard, Sr., New Iberia; Gerald David Girouard, Jr., Lafayette, and Donald Darcey, New Iberia, all of La., assignors to Coastal Timbers, Inc., New Iberia, La.

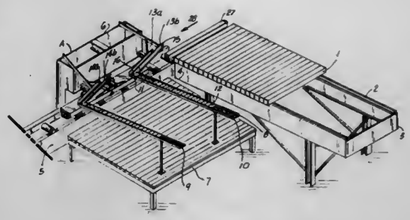
Continuation-in-part of Ser. No. 300,749, Sep. 6, 1994, Pat. No. 5,528,807, and a continuation of Ser. No. 207,118, Feb. 28, 1994, Pat. No. 5,343,606, and a continuation of Ser. No. 85,400, Jun. 30, 1993. This application Jun. 20, 1996, Ser. No. 665,670

Int. Cl.[6] E01B *29/32*

U.S. Cl. 29—33 K **11 Claims**

1. A railroad cross-tie pre-plating apparatus for fastening first and second plates having first and second spike apertures to a cross-tie, comprising:

a central, horizontal conveyor having first and second ends, and a medial area generally therebetween;



a cross-tie dispenser situated in contact with said first end of said central conveyor, said dispenser configured to selectively dispense a single cross-tie onto said central conveyor upon demand;

a pre-plating apparatus juxtaposed said central conveyor, comprising an upper and a lower template, each template having a front side and rear side, and first and second ends, said upper template having disposed thereon vertical manipulation means for lifting or lowering said upper template on demand, said upper template further having formed therein first and second plate cut-outs, said first and second cut-outs arranged to provide the appropriate area for placement of first and second plates, respectively, to a single tie under said upper template, said pre-plating apparatus further comprising:

lateral manipulation means for laterally situating a tie between said upper and lower templates for appropriate positioning under said upper template,

first and second plate conveyors having first and second ends, respectively, said first end of said first plate conveyor near the first plate cut-out of said upper template, said first end of said second plate conveyor situated near said second plate cut-out of said upper template, said plate conveyors configured such that a plate dispensed from said first end of first or second conveyor would land on or near the first or second plate cut-out of said upper template, respectively;

plate dispensing means for dispensing individual plates from said first and second plate conveyors automatically, said plate dispensing means comprising first and second pivotal loading members fitted to said first and second plate conveyors, said pivotal loading members having a front blocking member configured to interface with a first plate, selectively preventing the movement of or dispensing said first plate, said pivotal loading members having a rear blocking member configured to interface with a second plate when said first plate has been dispensed,

spike driving means for driving said spikes through the dispensed plates and into the dispensed tie;

first and second pairs of spike holders for individually positioning a spike above a respective spike aperture formed in one of said first or second dispensed plates, so that said spike may be driven into the dispensed tie, by said spike driving means, fastening said plate to the tie, said spike holders further comprising a at least one sensor mechanism for engaging said spike holders to move from under said spike driving means, once said spikes have begun being driven into said dispensed tie by said spike driving means.

5,813,104

SUCKER ROD THREAD PROTECTOR REMOVAL TOOL

Thomas W. Quick, 2513 SW. 93rd St., Oklahoma City, Okla. 73159

Filed Dec. 24, 1996, Ser. No. 774,099

Int. Cl.[6] B23P *19/02*

U.S. Cl. 29—235 **6 Claims**

1. A tool for removing a frusto-conical thread protector, having its smaller end closed, from the pin end of an oil well sucker rod, comprising:

a tubular housing having diametrically opposite slots adjacent one end and having a partition intermediate its ends forming

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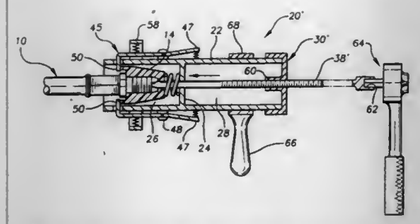


an open end socket axially surrounding the sucker rod pin end and the thread protector;

a pair of L-shaped stops having leg portions longitudinally secured in diametric opposition to the periphery of said housing open end socket for longitudinal pivoting movement of the respective end portion of each stop leg portion of said pair of stops toward and away from the periphery of the housing,

each stop of said pair of stops having a foot portion normally orthogonally projecting inwardly through said slots in confronting relation for abutting the adjacent end surface of said thread protector;

spring means at respective end portions of said leg portions for biasing said foot portions toward each other;

a plunger axially projecting into said housing through the partition from its end opposite said sucker rod;

a helical spring axially interposed between the partition and the adjacent end of the thread protector; and,

manually actuated handle means acting on said plunger for forceably moving said plunger axially relative to the housing and thread protector into axial abutting relation with said sucker rod and separating said thread protector from the sucker rod.

5,813,105

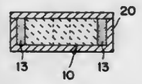
METHODS OF MAKING METAL CUTTING INSERTS HAVING SUPERHARD ABRASIVE BODIES

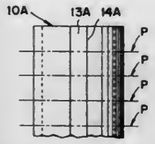
Peter Littecke, Huddinge, Sweden; Scott M. Packer, Pleasant Grove, Utah; Ronald B. Crockett, Provo, Utah, and Ghanshyam Rai, Sandy, Utah, assignors to Smith International, Inc., Houston, Tex., and Sandvik AB, Sandviken, Sweden

Division of Ser. No. 723,810, Sep. 30, 1996, Pat. No. 5,676,496, which is a continuation of Ser. No. 446,490, May 22, 1995, abandoned. This application Jul. 3, 1997, Ser. No. 888,055

Int. Cl.[6] B23P *17/00*

U.S. Cl. 29—411 **9 Claims**





1. A method of making a metal-cutting insert comprising the steps of:

A) providing a substrate having first and second side surfaces interconnected by an edge surface;

B) applying a superhard abrasive material to the substrate to extend along the edge surface thereof from the first side surface to the second side surface;

C) subjecting the substrate and superhard abrasive material to elevated pressure and temperature conditions inside of a container, whereby the superhard abrasive material is sintered and simultaneously bonded to the substrate;

D) removing from the container an element comprised of the substrate and a body of the superhard material bonded thereto; and

E) transversely slicing through the substrate and body to form from the element a plurality of inserts each having a pair of opposite side surfaces interconnected by an edge surface, with the body extending from one side surface to the other.

5,813,106

METHOD AND APPARATUS FOR MANUFACTURING AND LAYING OUT AN UMBILICAL

Svein Haug, Rastasvingen; Gunnar Monrad Jacobsen, Grågåsveien, and Knut von Trepka, Heimlibakken, all of Norway, assignors to Kvaerner Energy A/S, Oslo, Norway

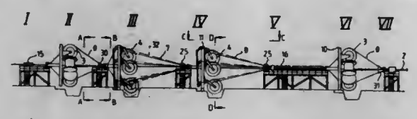
PCT No. PCT/NO93/00027, § 371 Date Aug. 17, 1994, § 102(e) Date Aug. 17, 1994, PCT Pub. No. WO93/17176, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 19, 1993, Ser. No. 290,760

Claims priority, application Norway, Feb. 21, 1992, 920689

Int. Cl.[6] B21D *39/00*

U.S. Cl. 29—429 **2 Claims**



1. A method of manufacturing an umbilical, comprising the steps of:

providing a core element;

providing first arcuate elongate elements each having a plurality of channels in a surface thereof;

providing second arcuate elongate elements each having a plurality of channels in a surface thereof;

providing elongate members;

providing a protective material;

feeding said core element along a longitudinal path;

wrapping a plurality of said first arcuate elongate elements helically around said core element as said core element travels along said longitudinal path, whereby said plurality of elongate elements form a first tubular structure surrounding said core element, with said first tubular structure being substantially coaxial with said core element, and having the channels extending helically around and facing outwardly away from said core element;

inserting one of said elongate members within each of said channels of said first tubular structure as said core element travels along said longitudinal path;

wrapping a plurality of said second arcuate elongate elements helically around said elongate members inserted within said channels as said core element travels along said longitudinal path, whereby said plurality of second elongate elements form a second tubular structure surrounding said elongate members and said first tubular structure, with the channels of the second tubular structure extending helically around and facing inwardly toward said core element, such that each of the channels of said second tubular structure cover and partially surround one of said elongate members inserted within the channels of said first tubular structure; and

wrapping said protective material around said second tubular structure.

5,813,107

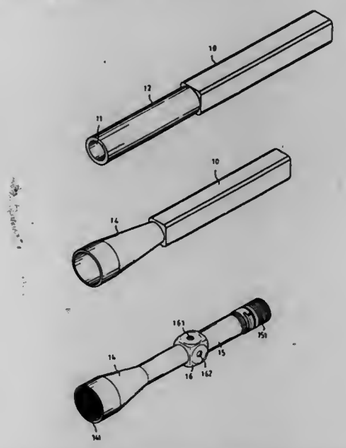
METHOD FOR MAKING A MAINTUBE OF A TELESCOPE

Chiu Jong Chen, Taichung, Taiwan, assignor to Panwell Metal Co., Ltd., Taichung, Taiwan

Filed Apr. 23, 1996, Ser. No. 636,577

Int. Cl.[6] B23P *13/04*

U.S. Cl. 29—557 **4 Claims**



1. A method for manufacturing a maintube of a telescope, said maintube including a first end having a cone member formed therein and including a middle portion having a cubic member formed therein and including a second end having an outer thread formed thereon, said method comprising:

preparing a shaft having a hole formed therein, said shaft including a first end and a second end and a middle portion,

machining said first end of said shaft into a cylindrical member,

holding said second end of said shaft,

forging said cylindrical member into said cone member, and

machining said shaft so as to form said cubic member in said middle portion of said shaft,

said cone member and said cubic member and said maintube including an integral configuration.

5,813,108

TERMINAL INSERTION MACHINE HAVING IMPROVED SHEARING MECHANISM

Dale Robert Ryan, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 15, 1996, Ser. No. 749,862

Int. Cl.[6] B23P *23/00*

U.S. Cl. 29—564.6 **31 Claims**

1. In a machine for severing a terminal from a carrier strip and inserting said terminal into an opening in a substrate, a terminal shearing unit for effecting said severing comprising:

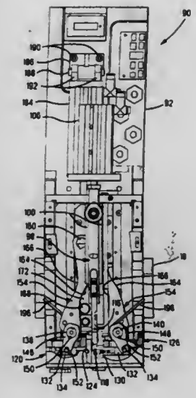
(1) a die assembly having a die, and opposing punch assembly having a punch, said die and punch arranged to cooperatively engage said terminal to effect said severing;

(2) a frame;

(3) a first arm pivotally attached to said frame at a first pivot, said first arm coupled to said die assembly for moving said die toward said punch upon pivoting said first arm in a first rotational direction, said first arm having a first cam surface along an edge thereof;

(4) a second arm pivotally attached to said frame at a second pivot, said second arm coupled to said punch assembly for moving said punch toward said die upon pivoting said second arm in a second rotational direction, said second arm having a second cam surface along an edge thereof that is of different shape than that of said first cam surface; and

(5) follower means in engagement with both said first and second cam surfaces and arranged to be moved in a first linear direction so that said follower means tracks along said first and second cam surfaces thereby causing said first and second arms to pivot in said first and second rotational directions, respectively, thereby causing said die and punch to move into said severing engagement with said terminal.



5,813,109

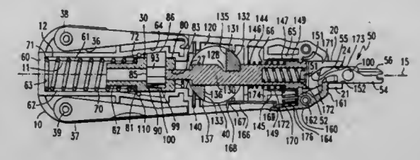
IMPACT/NO-IMPACT PUNCHDOWN TOOL FOR USE WITH CUT/NO-CUT OR WIRE INSERTION BLADE ASSEMBLY

Daniel L. Ziegler, Newhall, and Michael M. Fallandy, Ventura, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 21, 1997, Ser. No. 786,233

Int. Cl.[6] B23P *23/00*

U.S. Cl. 29—566.4 **24 Claims**



1. A wire-insertion and cutting tool comprising:

a handle containing a wire-insertion and cutting blade assembly holder; and

a wire-insertion and cutting blade assembly, which engages said holder, and having a wire-insertion and cutting blade, which is configured to engage a wire to be inserted into a wire receptacle, and is controllably operative to cut said wire in accordance with the orientation of said blade assembly relative to said holder, wherein said wire-insertion and cutting blade assembly has a cutting blade that is rotatable about an axis, and wherein said holder is configured to cause said cutting blade to rotate about said axis and cut a wire engaged thereby, for a first orientation of said blade assembly relative to said holder, and to prevent said cutting blade from rotating about said axis for a second orientation of said blade assembly relative to said holder.

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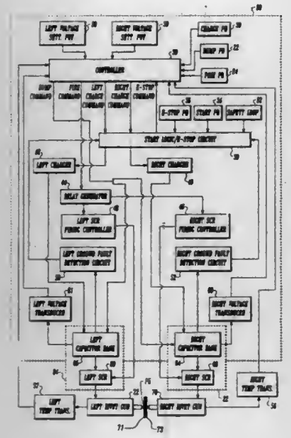
5,813,110

LOW-VOLTAGE ELETROMAGNETIC RIVETER

Paul R. Arntson, Bothell, and Martin A. Karge, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 9, 1996, Ser. No. 598,897
Int. Cl.[6] B23P *19/00;* **B21J** *15/24*
U.S. Cl. 29—701 **27 Claims**



1. A low-voltage electromagnetic riveter (LVEMR) for upsetting rivets comprising:

(a) two rivet guns positionable on opposite ends of a rivet to be upset, each of said rivet guns including:

(i) a mass-mounted coil;

(ii) a driver coil juxtaposed against and connected in circuit with said mass-mounted coil, said mass-mounted coil and said driver coil wound such that current flow through said mass-mounted and driver coils creates a repulsive electromagnetic force between said coils;

(iii) a driver affixed to said driver coil on the opposite side thereof from said mass-mounted coil positionable in alignment with one end of a rivet to be upset; and

(iv) a shock absorbing mechanism located on the opposite side of said mass-mounted coil from said driver coil;

(b) a capacitor power supply connected to the mass-mounted and driver coils of said rivet guns for storing electrical power and selectively discharging electrical current into said mass-mounted and driver coils of said rivet guns, said capacitor power supply including:

(i) a plurality of separately chargeable capacitors; and

(ii) a plurality of individually controllable switches connected to said plurality of separately chargeable capacitors such that the closure of one of said switches causes the charge on an associated capacitor to be discharged into the mass-mounted and driver coils of a related one of said rivet guns; and

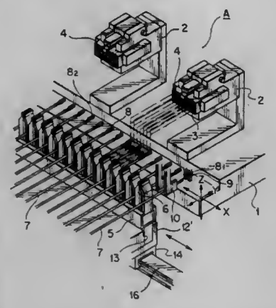
(c) a programmable control system connected to said plurality of individually controllable switches of said capacitor power supply for controlling the shape of the waveform of the electric current discharged into said mass-mounted and driver coils of said rivet guns by controlling the charging of said plurality of separately chargeable capacitors and applying discharge control signals to selected ones of said plurality of individually controllable switches in a preprogrammed order.

5,813,111

APPARATUS FOR INSERTING WIRE-EQUIPPED TERMINAL IN CONNECTOR HOUSING

Takamichi Maejima; Toshihiro Inoue; Hiroshi Hasegawa, and Atsushi Nakano, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 344,665, Nov. 22, 1994, Pat. No. 5,588,206. This application Oct. 3, 1996, Ser. No. 724,899
Claims priority, application Japan, Nov. 29, 1993, 5-298102
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—748 **3 Claims**



1. An insertion device for inserting a wire-equipped terminal into a connector housing comprising:

an elongated stand plate;

means for mounting at least one housing receiver at selected linearly spaced locations along said stand plate;

a connector housing mounted in each housing receiver, each said connector housing containing a plurality of terminal containers extending substantially perpendicularly with respect to the direction of elongation of said stand plate;

a wire clamping rod disposed in spaced relation with respect to said stand plate and mounted for movement parallel thereto;

a plurality of paired clamps carried by said clamping rod and operably positioned to secure terminal-bearing wires extending substantially parallel to said terminal containers;

an insertion unit having a pair of terminal-grasping picks and a pair of wire-clamping plates, said picks and said wire-clamping plates being controllably openable and closeable for releasably grasping a terminal and a wire, respectively;

means mounting said insertion unit for vertical movement between positions allowing securing of said wire-equipped terminals by said picks and said wire-clamping plates, respectively;

means mounting said insertion unit for movement in a direction parallel to said stand plate and said wire clamping rod;

means mounting said insertion unit for movement between an insertion position at which an associated wire-equipped terminal is insertable into a terminal container of said connector housing and a retracted position therefrom; and

control means operative to move said wire clamping rod and said insertion means, said control means including means for advancing said insertion unit with respect to said connector housing while sequentially opening said picks and plates to insert a wire-equipped terminal carried by said insertion unit into a predetermined terminal container in said connector housing, and means operative, following removal of said wire-equipped terminal from said clamps, for moving said clamping rod to position a succeeding wire-equipped terminal with respect to a succeeding predetermined terminal container in said connector housing.

5,813,112

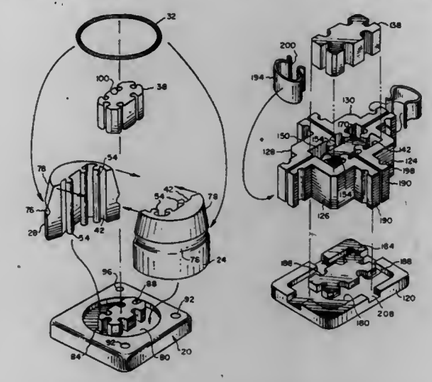
Patent Not Issued For This Number

5,813,113

FIXTURE FOR MAKING LAMINATED INTEGRATED CIRCUIT DEVICES

Gary L. Stewart, Lake Worth, and Milo Dunaj, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1996, Ser. No. 762,361
Int. Cl.[6] H05K *3/36;* **B23P** *19/04*
U.S. Cl. 29—760 **9 Claims**



1. A fixture for making laminated integrated circuit devices from layers of integrated circuits comprising:

a base;

at least two side body portions for substantially enclosing the sides of the laminated integrated circuit layers, said side body portions having inside surfaces for engaging said layers of integrated circuits so as to hold said layers in a desired alignment and having outside surfaces with grooves and,

a closed loop of elastic material received in said grooves of said outside surfaces for retaining said side body portions in position so as to hold said layers in said desired alignment.

5,813,114

FASTENING TOOL INCLUDING FASTENER-SUPPORTING NODES IN THE NOSE THEREOF

Stuart Edmund Blacket, Closeburn, and Ralph Fuhrmeister, Runcorn, both of Australia, assignors to Henrob Ltd., Clwyd, United Kingdom

PCT No. PCT/AU94/00013, § 371 Date Jul. 6, 1995, § 102(e) Date Jul. 6, 1995, PCT Pub. No. WO94/15736, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 7, 1994, Ser. No. 464,855
Claims priority, application Australia, Jan. 7, 1993, PL6704
Int. Cl.[6] B23Q *7/10*
U.S. Cl. 29—809 **39 Claims**

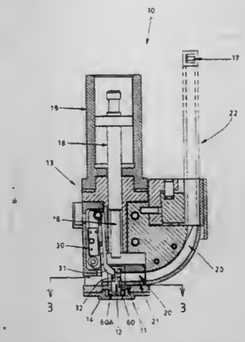
1. A setting tool for a fastening machine, the setting tool being operable without a preclamp function and comprising:

a nose piece with a fastener delivery passage therein and a fastener feed mechanism to advance fasteners to the delivery passage;

a fastener actuator slidably mounted for movement through the delivery passage to move a fastener therefrom to a work piece to be fastened thereby;

an actuator advancer to advance the fastener actuator through the fastener delivery passage to deliver fasteners to an opening in an end of the fastener delivery passage;

a fastener supporter comprising a plurality of rows axially aligned with the fastener delivery passage, each row presenting a series of resiliently actionable nodes therealong, the plurality of rows being spaced angularly about a circumference of the fastener delivery passage;



said fastener supporter being provided along a side wall of the fastener delivery passage to guide and maintain orientation of the fastener while the fastener is moved through the fastener delivery passage by the fastener actuator, the fastener supporter extending axially along the fastener delivery passage and presenting a series of contact points at which an extended head portion of a fastener is contacted upon passing through the fastener delivery passage to guide and orient the fastener, and

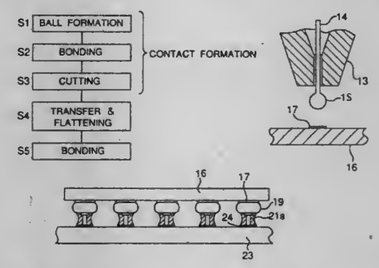
wherein each row of nodes is formed by a series of balls mounted resiliently in a wall of the fastener delivery passage along slots in the wall of the fastener delivery passage, with a portion of each ball projecting into the fastener delivery passage, each ball being pressed towards the fastener delivery passage by a spring or block of resilient material extending behind the ball, a first ball of each series of balls along the fastener delivery passage being free to move along an axial direction of the fastener delivery passage and being resiliently biased to adjoin a second ball in its respective series of balls.

5,813,115

METHOD OF MOUNTING A SEMICONDUCTOR CHIP ON A WIRING SUBSTRATE

Yoshihiko Misawa, Katano; Koichi Morita, Osaka; Keiji Saeki, Kobe, and Setsuo Horimoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Aug. 2, 1995, Ser. No. 510,273
Claims priority, application Japan, Aug. 3, 1994, 6-182021
Int. Cl.[6] H05K *3/30;* **H01R** *43/16*
U.S. Cl. 29—832 **2 Claims**



1. A method of mounting a semiconductor chip on a wiring substrate, which comprises the steps of:

feeding a metallic wire through a capillary;

fusing an end of the metallic wire to form a ball;

pressing and bonding the ball against and to an electrode pad formed on the semiconductor chip;

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cutting the metallic wire at a location in the proximity of the ball so that a portion of the metallic wire remains as a protruding contact on the ball;

repeating said steps of feeding, fusing, pressing and cutting to form a plurality of protruding contacts;

pressing the protruding contacts against a fine surface of a shaping platform coated with a paste-like electrically-conductive adhesive film to thereby cause the protruding contacts to have a given height and transfer a portion of the adhesive film to the protruding contacts; and

bonding each of the protruding contacts to an electrically-conductive film formed on the wiring substrate via the transferred portion of the adhesive film.

5,813,116

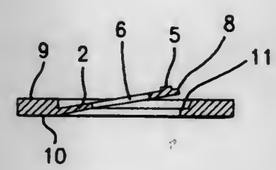
Patent Not Issued For This Number

5,813,117

METHOD OF MAKING A FLEXIBLE CONTACT TAB

Gianfranco Natali, 1, Via Roma, I-06019 Umbertide-Perugia, Italy

Filed Feb. 5, 1997, Ser. No. 796,109
Claims priority, application Italy, Feb. 26, 1996, AR96A0006
Int. Cl.[6] H01R *43/16*
U.S. Cl. 29—874 **8 Claims**



1. A method of producing from a metal plate having an initial thickness, an elastic and flexible contact tab emerging from said metal plate, and designed to reach and contact another plate placed in close parallel proximity to said metal plate, comprising the steps of:

(a) shearing an elongated vent hole on said metal plate to a size that is sufficiently large to receive metal during a subsequent compression of metal surrounding said elongated vent hole;

(b) coining, from a first side of said metal plate, an area around said elongated vent hole to form a generally planar surface area defining a flexible contact tab surface area with a contact button surface area within said planar surface area, wherein said coining reduces the size of said elongated vent hole, hardens said planar surface area, and reduces the thickness of said planar surface area; and

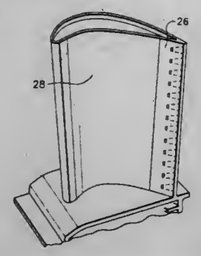
(c) shearing, from a second side of said metal plate, said planar surface area to obtain a line defining a shape of said flexible contact tab so that said flexible contact tab is defined and is made to protrude through said first side of said metal plate.

5,813,118

METHOD FOR REPAIRING AN AIR COOLED TURBINE ENGINE AIRFOIL

Lawrence J. Roedl, West Chester, and Joseph H. Bowden, Jr., Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 23, 1997, Ser. No. 880,669
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—889.1 **8 Claims**



1. In a method for repairing a turbine engine airfoil including an outer wall surface having thereon an environmental resistant coating, the steps of:

selecting a discrete portion of the outer wall surface to be masked;

applying an outer wall maskant to the coating on the selected discrete portion to cover the coating on the selected portion, the maskant being sufficient to avoid removal of the coating on the selected portion during a subsequent coating removal processing, thereby providing a masked outer wall surface and an unmasked outer wall surface;

removing the coating from the unmasked outer wall surface;

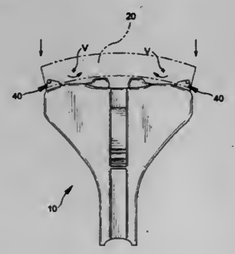
removing the maskant from the outer wall surface; and then, repairing the airfoil.

5,813,119

RAZORS WHICH ACTIVELY FLEX A RAZOR HEAD IN RESPONSE TO SHAVING FORCES

Frank Anthony Ferraro, Trumbull, Conn., and Ernest Albert Ortiz, Chapel Hill, N.C., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 17, 1997, Ser. No. 785,475
Int. Cl.[6] B26B *21/22*
U.S. Cl. 30—49 **31 Claims**



1. A razor for actively flexing a flexible razor head, said razor comprising:

a support; and

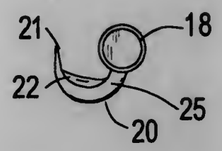
means for actively flexing a razor head, said flexing means movably connected to said support and disposed for contacting portions of a razor head, wherein said flexing means is moveable between a first position and a second position, whereby force exerted on a first razor head portion in a first direction will cause said flexing means to rotatably move a second razor head portion in a second direction which is different from said first direction, wherein said flexing means comprises at least one rotating pivot and wherein said rotating pivot comprises a slot which guides said rotating pivot between said first and second positions.

5,813,120

FOOD UTENSIL AND GRATE CLEANING TOOL

Emanuel A. Strob, P.O. Box 195, Manning, N. Dak. 58642

Filed May 3, 1997, Ser. No. 868,003
Int. Cl.[6] A47J *33/00;34/00*
U.S. Cl. 30—123 **3 Claims**



1. A food utensil and grate cleaning tool comprising:

an elongate shaft having a first end and a second end;

a handle at said first end; and

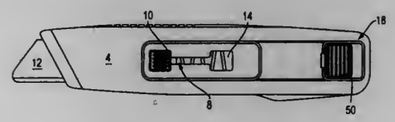
a hook portion at said second end, said hook portion having a tapered and pointed end for hooking onto and retrieving food and further having an inside edge and a bladed edge along said inside edge, said hook portion essentially being C-shaped, further said hook portion lying generally in a plane and being adapted to move in said plane upon rotation of said elongate shaft about its longitudinal axis.

5,813,121

AUTOMATICALLY RETRACTABLE UTILITY KNIFE

Donald Gringer, New York, N.Y., assignor to Allway Tools, Inc., Bronx, N.Y.

Filed Jun. 17, 1996, Ser. No. 664,683
Int. Cl.[6] B26B *1/08*
U.S. Cl. 30—162 **8 Claims**



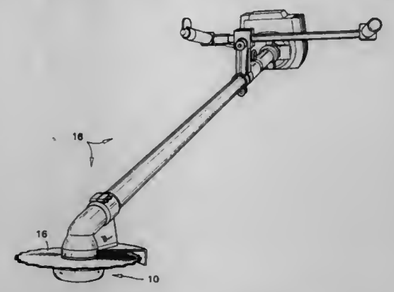
1. A cutting device housing comprising first and second separable halves, the first half comprising a resilient locking arm, the locking arm comprising i) an upstanding portion having a first end attached to the first half of the housing and a second end, ii) an actuating arm extending laterally from the second end of the upstanding portion, whereby downward force on the actuating arm results in a bending of the upstanding portion, and iii) a locking lip on the second end of the upstanding portion extending laterally in a direction opposite to the direction of bending of the upstanding portion during downward force on the actuating arm, the second half comprising a locking aperture sized to receive the second end of the upstanding portion, and a locking shoulder adjacent to the locking aperture.

5,813,122

VEGETATION CONTROL MATERIAL APPLICATOR

Aboud Mubareka, 1125 Power Road, St. Joseph, Madawaska County, New Brunswick, Canada, E7B 2M3

Filed May 9, 1997, Ser. No. 853,203
Int. Cl.[6] A01C *15/06;* **A01D** *34/82*
U.S. Cl. 30—276 **20 Claims**



1. A combination of a brush saw having a circular saw blade and a vegetation control material applicator mounted under said saw blade, said vegetation control material applicator comprising:

a circular receptacle mounted on an arbour of said saw blade near an underside surface of said saw blade, said circular receptacle having a volume for containing an amount of vegetation control material in fluid form;

a circular valve assembly affixed to said circular receptacle between said circular receptacle and said circular saw blade, said circular valve assembly being mounted against said underside surface of said saw blade; said circular valve assembly and said circular receptacle each having an outside diameter being smaller than a diameter of said circular saw blade;

said circular valve assembly having a closable gap associated therewith, said closable gap extending outwardly from an inside surface of said circular receptacle and being contiguous with said underside surface of said circular saw blade;

said circular valve assembly also having a gap closure means associated therewith and being connected to said closable gap and to said circular saw blade for opening said closable gap when said circular blade is flexing under sawing stresses, and for closing said closable gap when said circular saw blade is rotating in an unstrained mode;

whereby said vegetation control material is dispensed by centrifugal force through said closable gap and on said underside surface of said circular saw blade only when said circular saw blade is sawing.

5,813,123

MOTOR CHAINSAW WITH A CHAIN BRAKING DEVICE

Dieter Wieland; Herbert Armbruster, both of Remseck, and Gerhard Meyer, Ludwigsburg, all of Germany, assignors to Andreas Stihl AG & Co., Waiblingen, Germany

Filed May 10, 1996, Ser. No. 644,522
Claims priority, application Germany, May 11, 1995, 195 17 293.0
Int. Cl.[6] B27B *17/00;* **F16D** *49/04*
U.S. Cl. 30—382 **18 Claims**

1. A motor chainsaw comprising:

a housing with a motor and a saw chain;

an actuator for said motor connected to said housing;

a braking device for said saw chain positioned in said housing;

said braking device comprising a brake drum and a brake band guided around said brake drum;

said braking device further comprising a brake lever connected to said housing so as to be pivotable about a first axis of

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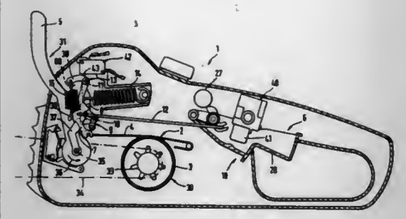


rotation and acting on said brake band for moving said brake band from a release position into a braking position at said brake drum;

a return kick brake for actuating said braking device;

said return kick brake having a ready position and an actuated position in which said brake band is moved into said braking position at said brake drum;

said return kick brake comprised of a band protection grip, a control lever, and a return kick brake spring for loading said control lever;

said control lever, when said return kick brake is moved from said ready position into said actuated position, pivoting said brake lever about said first axis of rotation into said braking position;

a coasting brake for actuating said braking device;

said coasting brake comprising a transmission member connected to said actuator and said brake lever;

said coasting brake further comprising a coasting brake spring for loading said brake band in said braking position;

said brake lever having a second axis of rotation extending parallel to said first axis of rotation;

said brake lever pivoted about said second axis of rotation when said coasting brake is actuated;

wherein said transmission member has a first end engaging said brake lever and wherein said first end is positioned adjacent to said first axis of rotation;

a rocker arm pivotably connected to said actuator, said rocker arm comprising a recess, wherein said transmission member comprises a second end received in said recess so as to be moveably guided within said recess in a pulling direction of said transmission member; and

said rocker arm having a third axis of rotation and said actuator having a fourth axis of rotation, wherein said third and fourth axes of rotation extend parallel to one another.

5,813,124

ANGLE MEASURING DEVICE

Holger Freitag, Bochum, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Continuation of Ser. No. 400,957, Mar. 7, 1995, abandoned. This application Apr. 2, 1996, Ser. No. 627,917

Claims priority, application Germany, Mar. 7, 1994, 44 08 056.5

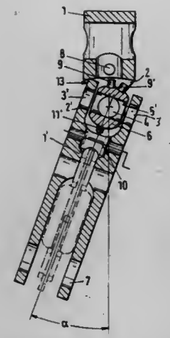
Int. Cl.[6] G01B *7/30*

U.S. Cl. 33—1 N **4 Claims**

1. An angle measuring device, for measuring the pendulum angle of a cable, comprising:

first and second connection components, each connection component having one end configured in a U-shape with spaced apart forked ends and a bore extending through said fork ends, said first and second connection components being located relative to one another so that their respective forked ends are adjacent one another and the bores through said forked ends are at right angles to one another, a joint ball having a pair of bores at right angles to one another and being respectively aligned with said bores in said forked ends of said first and said second connection components;

a first axle and a second axle arranged at right angles to one another, and connected to said first and said second connection components and said joint ball through their respective



bores to define a cardanic-type joint such that said first and said second connection components can be moved relative to one another;

first and second measurement value pick-ups, said first measurement value pick-up comprising a first Hall sensor mounted on said first connection component and a first pair of magnetic elements operatively connected to said second connection component in opposite polarity and in spaced apart relation to one another form an air gap in which the magnetic field produced by said first pair of magnetic elements is present, and in confronting relation to said first Hall sensor so that said magnetic field in said first pair of magnetic elements may be detected by said first Hall sensor, said second measurement value pick-up comprising a second Hall sensor mounted on said second connection component and a second pair of magnetic elements operatively connected to said first connection component in opposite polarity and in spaced apart relation to one another to form an air gap in which the magnetic field produced by said second pair of magnetic elements is present, and in confronting relation to said second Hall sensor so that said magnetic field in said air gap between said second pair of magnetic elements may be detected by said second Hall sensor.

5,813,125

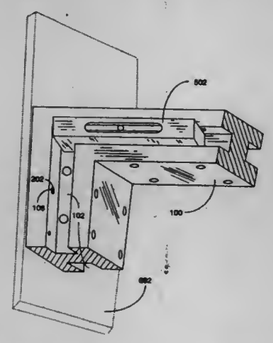
SELF HOLDING LEVELING SQUARE

John Byrn, 771 Cotton Bay Dr., East #2812, West Palm Beach, Fla. 33406

Filed Aug. 27, 1996, Ser. No. 703,538

Int. Cl.[6] B43L *7/027;* **G01C** *9/00*

U.S. Cl. 33—451 **20 Claims**



1.A self holding square and level for hands free attachment to a work surface, comprising:

a square, further comprising:

at least one central channel, the central channel formed by a first wall and a second wall extending outward from the square;

at least one mounting aperture in the first wall, the mounting aperture having a diameter sufficiently large enough to accept a screw; and

at least one screw driver aperture in the second wall, the screw driver aperture having a diameter large enough to accept a screw driver shaft and positioned substantially opposite the mounting aperture such that the screw driver can drive a screw in the mounting aperture; and

a first level, the first level sized such that it slidably and snugly fits within the central channel such that it can be placed and held in a preselected location in the central channel;

whereby, the square and the first level can temporarily be edge mounted to a work surface for hands free use.

5,813,126

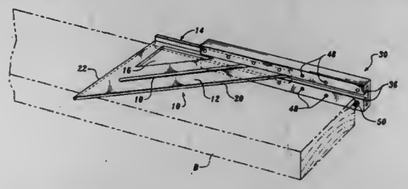
SPEED SQUARE EXTENSION BAR AND SAW GUIDE

Curtis Edward Dahl, Eagle River, Ak., assignor to Toni Rae Fisher, Kenai, Ak., a part interest

Filed Apr. 25, 1997, Ser. No. 845,606

Int. Cl.[6] B43L *7/027*

U.S. Cl. 33—474 **6 Claims**



1. An extension attachment for a speed square having a flat plate including one or more unflanged marking edges and a base flange extending along a side of the plate, said extension attachment comprising an elongated bar having a longitudinally extending channel of a cross section slightly greater than the cross section of the flange, said bar having a groove in a side thereof which groove opens into said channel such that the square is slidable in the channel with a base portion of the plate adjacent to the flange received in the groove, means for locking and unlocking the bar relative to the square, and a stop projecting from the grooved side of the bar.

5,813,127

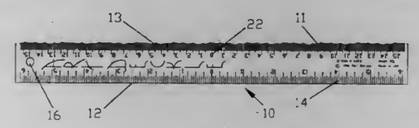
ART DECKLE

Patricia A. Blevins, P.O. Box 5314, Englewood, Fla. 34224-1428

Filed Dec. 9, 1996, Ser. No. 762,391

Int. Cl.[6] G01B *3/04*

U.S. Cl. 33—492 **2 Claims**



1. A device for forming a deckle edge, an uncut, softly frayed, natural tear for elegant paper edges, said tool comprising:

a flat, rectangular shaped, hardened stainless steel tool having a first edge, a second edge, a first end and a second end, a top surface, and a reverse side,

a deckle cutting edge formed on said first edge, said cutting edge having a sharp cutting surface on said reverse side, said cutting edge being formed by a computer controlled cutting device to provide an accurately, reproduced shape,

a straight edge formed on said second edge, an image of a metric scale formed on said top surface along said deckle cutting edge, said metric scale having a zero center formed with increments of said scale increasing outwardly toward said first and second ends,

an image of an inch scale formed on said top surface along said straight edge, said inch scale having a zero center formed with increments of said scale increasing toward said first and second ends,

said deckle edge tool formed with a downwardly facing curve for keeping said first and second ends pressed against the paper with a small pressure downwardly on said top surface, and

a hole formed near said first end for hanging convenience.

5,813,128

BALL BAR APPARATUS FOR CALIBRATING A MACHINE

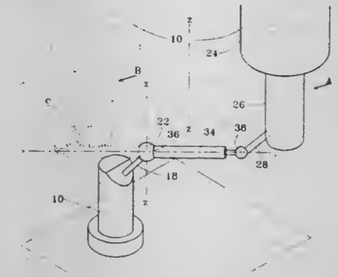
Andrew M. Bailey, Schaumburg, Ill., assignor to Renishaw PLC, Wotton-Under-Edge, United Kingdom

Filed Jan. 17, 1997, Ser. No. 785,607

Claims priority, application United Kingdom, Jan. 27, 1996, 9601679

Int. Cl.[6] G01C *25/00*

U.S. Cl. 33—502 **10 Claims**



1. Apparatus for use in calibrating relative movements of parts of a machine comprising a mounting device for supporting a telescoping calibration device for rotational movement about the centre of a ball during said relative movements of said machine parts, said device including support means for supporting the ball on one of the machine parts and wherein the centre of the ball defines the intersection of three orthogonal planes and the mounting device lies wholly within a volume not intersected by the planes.

5,813,129

GUIDING DISK FOR DRILLING HOLES ON A BOWLING BALL

Shui-Chih Tseng, No. 1-2, Hsin-Liao, Lin-Kou, Taipei County, Taiwan

Filed Nov. 15, 1996, Ser. No. 749,651

Int. Cl.[6] B43L *13/20;* **G01B** *3/14*

U.S. Cl. 33—509 **1 Claim**

1. A guiding disk for drilling holes on a bowling ball, the body of said guiding disk is a transparent domed plastic plate, the radian

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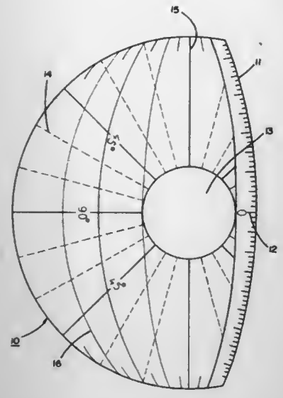
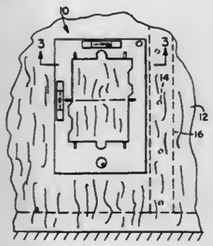


thereof is the same as that of the surface of a common bowling ball, the upper edge of said body is marked with indices, a reference hole which is a round hole is formed by excavation at a position near the middle of said indices, said reference hole is above and the size thereof is almost the same as that of a weight in said bowling ball, a plurality of radiant angular lines are prepared and extend from the center of said reference hole, among said radiant angular lines, there is a reference line provided at the location of zero degree of radiant angle, a plurality of secondary reference lines with the same interspace therebetween are also provided on said body, by means of the above construction, positions of said holes to be drilled can be found very quickly.

5,813,130
ELECTRICAL GEM BOX LEVELING TEMPLATE
Robert P. MacDowell, 65 Florence St., Central Islip, N.Y. 11722
Filed May 5, 1997, Ser. No. 851,215
Int. Cl.[6] G01B *5/00*
U.S. Cl. 33—528 **6 Claims**



1. An electrical gem box leveling template abutable against a wall and utilized to mark a position on the wall at which a gem box is to be mounted in the wall between studs, comprising:

a) a plate; said plate being thin plastic and rectangular-shaped, and having a front face, a back face abutting against the wall when said electrical gem box leveling template is being utilized, a top edge being horizontally-oriented, a bottom edge being horizontally-oriented, and a pair of longitudinal edges being vertically-oriented; said plate further having a through-opening extending concentrically therethrough, from said front face of said plate to said back face of said plate, and being shaped to conform to the gem box; said throughopening in said plate being generally rectangular-shaped and defined by a pair of horizontal edges and a pair of vertical edges;

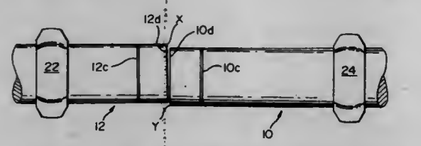
b) a first spirit level disposed on said plate for assuring horizontal leveling of said electrical gem box leveling template;

c) a second spirit level disposed on said plate for assuring vertical leveling of said electrical gem box leveling template;

d) a bubble enclosure being clear plastic and hemispherically-shaped and disposed on said front face of said plate, between said bottom edge of said plate and a lowermost horizontal edge of said pair of horizontal edges of said throughopening in said plate, at their midpoints; and

e) a magnet housed in said bubble enclosure and having 360 degrees of freedom therein by virtue of said bubble enclosure being clear and hemispherically-shaped and said magnet being freely movable in said bubble enclosure for allowing location of the nails in the wood stud in the wall and the steel stud in the wall by being attracted thereto regardless of the angle said plate is oriented on the wall.

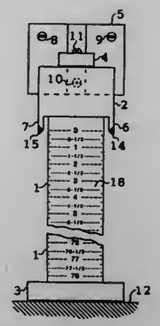
5,813,131
TELESCOPE MOUNTING ALIGNMENT BARS
John D. Werre, 3820 Foothill Rd., Kalispell, Mont. 59901
Filed Oct. 2, 1995, Ser. No. 538,279
Int. Cl.[6] G01B *5/25*
U.S. Cl. 33—645 **9 Claims**



1. A pair of telescopic sight mount aligning bar means, each bar means comprising an elongated rod having a cylindrical inner end portion with a planar circular inner end bounded by a circular peripheral edge having the same diameter as the diameter of said cylindrical inner end portion, the circular inner ends of the two bar means being perpendicular to the longitudinal axis of their respective rods, and the circular inner ends of the two bar means having substantially identical diameters and peripheral edges so that the two inner ends may be closely juxtaposed when used to align, and to check the alignment of, a telescopic sight mount whereby a telescopic sight mount misalignment will be revealed by a misalignment of said peripheral edges relative to one another with such misalignment being palpable to the touch of a user when the two inner ends are closely juxtaposed, and whereby such misalignment also will be revealed by a non-parallelity between said two inner ends.

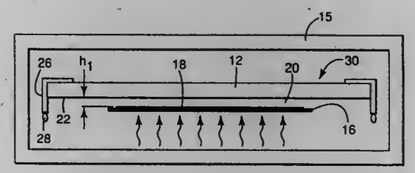
5,813,132
HEIGHT MEASURING DEVICE
Lawrence Edward Bodkip, Sr., P.O. Box 16482, 1149 Molokai Rd., Jacksonville, Fla. 32216
Filed Jun. 28, 1996, Ser. No. 672,408
Int. Cl.[6] G01B *3/10;* **G01C** *5/00*
U.S. Cl. 33—759 **13 Claims**

1. In a device for measuring height, the improvement comprising a flexible, elongated measuring element contained within a holder from which said element is extendable and to which said element is retractable, said element being adapted to permit measurement by extension of said element to be determined at said holder, said element having increments which are decreased with extension of said element and increased with retraction of said



element, bracket means for securing a portion of the said device relative to a first surface and at a fixed distance from a second surface, said distance being fixed so that said element provides a determination of a linear dimension of an object when linearly extended, from the first surface, in a direction perpendicular to the second surface, so that another portion of said device contacts the object when the object is in contact with the second surface, said holder and said element, when retracted within said holder, being adapted to remain adjacent to said bracket means and away from the second surface when not in use.

5,813,133
COATED SUBSTRATE DRYING SYSTEM WITH MAGNETIC PARTICLE ORIENTATION
John D. Munter, Oakdale; William B. Kolb, and Gary L. Huelsman, both of St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 699,522, Sep. 4, 1996, Pat. No. 5,694,701. This application Jul. 7, 1997, Ser. No. 888,721
Int. Cl.[6] F26B *3/34*
U.S. Cl. 34—248 **22 Claims**



20. A method for drying a coating on a substrate, wherein the coating comprises particles in a liquid, the particles being capable of being affected by a magnetic field, the method comprising the steps of:

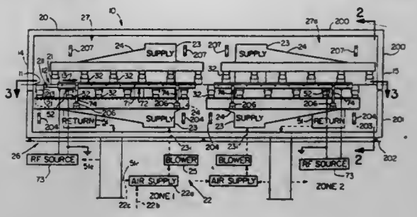
locating a condensing surface spaced from the substrate along the path of the substrate to create a gap between the substrate and the condensing surface;

evaporating the liquid from the coating to create a vapor;

condensing the vapor on the condensing surface to create a condensate; and

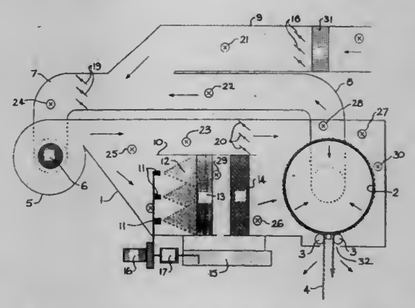
creating a magnetic field from outside of the space between the condensing surface and the coated substrate and imposing the field upon the particles in the coating.

5,813,134
APPARATUS AND METHOD FOR DRYING OR CURING WEB MATERIALS AND COATINGS
Kyung Min, Mentor, and John E. Johansen, Ashtabula, both of Ohio, assignors to Avery Dennison Corporation, Pasadena, Calif.
Division of Ser. No. 540,096, Oct. 6, 1995, Pat. No. 5,659,972. This application Dec. 11, 1996, Ser. No. 763,748
Int. Cl.[6] F26B *3/34*
U.S. Cl. 34—255 **37 Claims**



21. Apparatus for drying/curing a web, comprising means for directing RF energy directly to a web, and reflector means for reflecting RF energy to the web, and said reflector means comprising an RF field compression plate.

5,813,135
CONDITIONING OF FABRICS BY RECIRCULATING AIR/STEAM METHOD AND APPARATUS
Neville A. Michie, Beacon Hill, Australia, and David H. Tester, Ilkley, United Kingdom, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia
PCT No. PCT/AU95/00285, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO96/07784, PCT Pub. Date Mar. 14, 1996
PCT Filed May 17, 1995, Ser. No. 737,861
Claims priority, application Australia, May 18, 1994, PM5671; Feb. 14, 1995, PN1131
Int. Cl.[6] F26B *7/00*
U.S. Cl. 34—381 **16 Claims**



11. A process for conditioning fabric including forcing a stream of conditioned air of predetermined temperature and relative humidity through a fabric while moving the fabric through a conditioning chamber, wherein the predetermined temperature and relative humidity are maintained by

(a) admitting ambient air to a stream of recirculating conditioned air and varying the proportion of ambient air so admitted, and

(b) saturating a portion of the total air stream that is forced through the fabric and varying the proportion so saturated.

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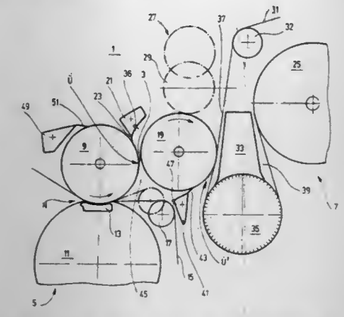
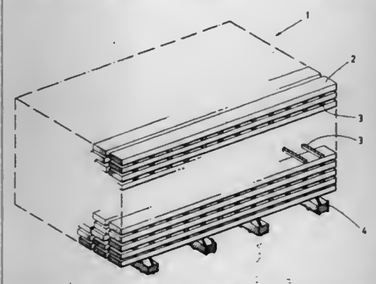
5,813,136
MACHINE FOR PRODUCING A SHEET OF MATERIAL BY DIRECT PRESS TO DRYER PASSAGE
Andreas Meschenmoser, Horgenzell, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany
Filed Jan. 27, 1997, Ser. No. 791,475
Claims priority, application Germany, Jan. 25, 1996, 196 02 492.7
Int. Cl.[6] D21F *5/00*
U.S. Cl. 34—446 **27 Claims**



9. A process for transferring a sheet of material in a sheet producing machine, the machine comprising a pressing part having at least one pressing device, a dryer part including a plurality of dryer cylinders, and a first dryer cylinder located adjacent to the pressing part to form a transfer region, the process comprising:

transferring the sheet of material from a press-roll of a pressing part directly onto a first dryer cylinder of a dryer part.

5,813,137
LATH FOR LUMBER STACKING
David M. Townsend, Langton, Canada, assignor to Breeze Dried, Inc., Canada
Filed Dec. 4, 1995, Ser. No. 566,733
Claims priority, application Canada, Aug. 23, 1995, 2156761
Int. Cl.[6] F26B *3/00*
U.S. Cl. 34—518 **18 Claims**



9. An improved separator for separating lumber in a stack made up of a plurality of courses of lumber, said separator having:

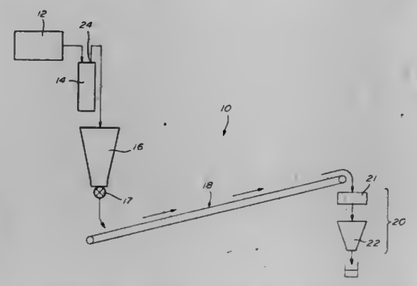
a length, a height, and a width, the length being substantially longer than the width and spanning across one or more pieces of lumber in a course, the height being sufficient to separate a pair of courses in the stack for air circulation therebetween;

a plurality of first grooves extending transverse to the length of the separator in one direction; and

a plurality of second grooves extending transverse to both the length of the separator and the first grooves;

said plurality of first grooves and said plurality of second grooves forming a plurality of protrusions for contacting one or more pieces of lumber in a course, the protrusions having a height sufficient to permit air circulation within said grooves.

5,813,138
AERATED BELT CONVEYOR SYSTEM FOR CONVEYING HOT EXPANDED MINERALS
Richard Barabé, 7602, St-Denis, Montréal, Québec, Canada, H2R 2E6, and Yvan Boisvert, 48, de l'Église, Baie du Febvre, Québec, Canada, J0G 1A0
Filed Dec. 19, 1996, Ser. No. 770,591
Int. Cl.[6] F26B *17/00*
U.S. Cl. 34—580 **17 Claims**



1. An aerated belt conveyor system for conveying expanded mineral material comprising:

an elongate frame defining a material conveying path;

a power driven belt conveyor mounted longitudinally to said elongate frame; said belt conveyor having a first end and a second end;

a longitudinal envelope means for enclosing said belt conveyor, said envelope means comprising air intake means and air exhaust means spaced apart from said air intake means; said air intake means being larger than said air exhaust means;

a material inlet for supplying expanded mineral material to said belt conveyor;

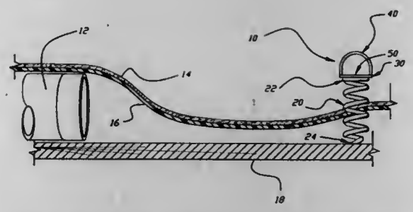
a material outlet for receiving mineral material conveyed to said second end of said belt conveyor; and

means for producing a flow of air in said envelope from said air intake means to said air exhaust means, for the purpose of aerating expanded mineral material conveyed onto said power driven belt conveyor; said air flow producing means include means for drawing air from said longitudinal envelope.

5,813,139
METHOD AND DEVICE FOR DRYING CARPET
Ryan C. Lillicotch, 3347 Annandale Rd., Falls Church, Va. 22047
Filed Mar. 14, 1997, Ser. No. 818,154
Int. Cl.[6] F26B *9/00*
U.S. Cl. 34—618 **1 Claim**

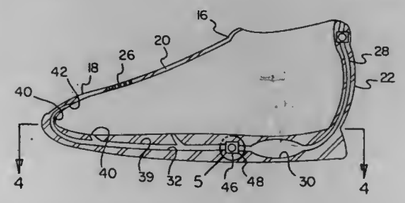
1. A method for drying carpet using a device including a substantially U-shaped handle having a first end and a second end, and a coiled rod having a first end rigidly connected to the first end and the second end of the handle and a sharpened second end, said method comprising the steps of:

piercing a hole in the carpet with said sharpened second end of said rod;



rotating said handle such that the hole travels along said rod; and blowing air under the carpet.

5,813,140
VENTILATED SHOE
Abdelhakim R. Obeid, 61 Amsterdam Pl., Staten Island, N.Y. 10314
Filed Jun. 30, 1997, Ser. No. 885,523
Int. Cl.[6] A43B *7/06;13/20*
U.S. Cl. 36—3 R **6 Claims**



1. A new and improved ventilated shoe comprising, in combination:

a shoe having a horizontally oriented flexible sole and an upper body, the upper body of the shoe including a bevelled upper toe portion, a lace portion integrally connected to the toe portion, a vertical heel portion, and a pair of side portions integrally connected between the upper toe portion, the lace portion, and the heel portion for defining an interior space with an open top for inserting a foot within the shoe;

a plurality of apertures formed in the upper toe portion of the upper body of the shoe below the lace portion thereof for allowing air to exit the interior space of the shoe;

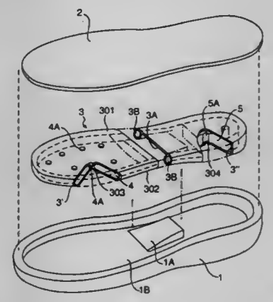
an entry conduit having a first open end in communication with an upper edge of the heel portion, the entry conduit being vertically oriented within a central extent of the heel portion;

a bladder having a oval configuration and positioned within the sole adjacent the heel portion thereof, a rear extent of the bladder being in communication with a second end of the entry conduit and adapted to be compressed upon the shoe engaging the ground and further return to an original shape thereof upon the shoe disengaging the ground;

a plurality of exit conduits including a pair of horizontally oriented linear side conduits each having a first end in communication with a front extent of the bladder and a second end positioned within the sole adjacent a point where the upper toe portion and respective side portions of the upper body of the shoe connect with the sole, the side conduits including a first pair of bores formed in the sole between the interior space of the shoe and midpoints of the side conduits and a second pair of bores formed in the sole between the interior space of the shoe and ends of the side conduits, the exit conduits further including a central conduit having a first end in communication with the front extent of the bladder and a second end extended through the upper toe portion of the upper body of the shoe, the central conduit including a first pair of bores formed in the sole between the interior space of the shoe and a central extent of the central conduit and a second bore formed in the second end of the central conduit; and

a pair of valves each having a housing including a central spherical compartment, a single entry passage in communication with a central extent of the spherical compartment, a pair of spaced and parallel exit passages in communication with outer ends of the spherical compartment, and a spherical ball having a diameter slightly less than that of the spherical compartment, the spherical ball precluding air from flowing from the exit passages to the entry passage and allowing air to flow from the entry passage to the exit passages, the valves including a first valve positioned within the entry conduit adjacent the first end thereof with the exit passages thereof in communication with the bladder and the entry passage thereof in communication with an exterior of the shoe and a second valve positioned between the bladder and the exit conduits with the exit passages thereof in communication with the exit conduits and the entry passage thereof in communication with the bladder.

5,813,141
CUSHIONING SOLE FOR FOOTWEAR
Woo Joo Cho, 707 Onchun-2 Dong, Lucky Apt. 10-1102, Dongre-Ku, Pusan, Rep. of Korea
Filed Apr. 17, 1997, Ser. No. 839,321
Int. Cl.[6] A43B *13/20*
U.S. Cl. 36—29 **5 Claims**



1. A cushioning sole for footwear, comprising:

an outer sole having a hollow inside and a lug disposed on a middle portion of said hollow inside,

an air bag enclosed with a top cover and a bottom cover, said air bag including:

a heel chamber containing a plurality of sponge plates, a plurality of rear openings disposed between said sponge plates, and a plurality of rear profiles extending from said bottom cover and disposed in said plurality of rear openings;

a pair of air passages and a hollow portion disposed in a middle portion thereof for tightly adhering with said lug;

a front chamber containing a plurality of sponge plates, a plurality of front openings disposed between said sponge plates, and a plurality of front profiles knotted from said top and bottom covers and disposed in the plurality of front openings; and

a midsole secured to said outer sole containing said air bag, whereby when the wearer of the footwear steps on a surface and releases from the surface, the air moves between the heel and from chambers through a pair of air passageways so as to absorb shock and cushion impact and massage a sole of a foot.

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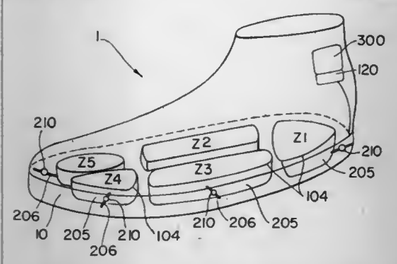
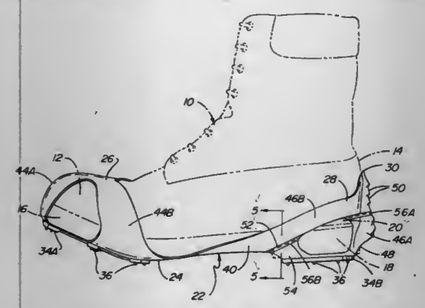
5,813,142
SHOE SOLE WITH AN ADJUSTABLE SUPPORT PATTERN
Ronald S. Demon, 450 Memorial Dr., Cambridge, Mass. 02139
Continuation of Ser. No. 599,584, Feb. 9, 1996, abandoned.
This application Nov. 18, 1997, Ser. No. 972,450
Int. Cl.[6] A43B *13/20*
U.S. Cl. 36—29 **20 Claims**



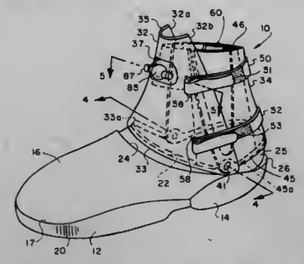
1. A shoe to be worn by a user over a plurality of strides, each stride including an impact by the shoe with the traveling surface, the shoe having an adjustable cushioning sole, comprising:
a fluid bladder disposed in the sole having fluid therein;
a duct in communication with said fluid bladder and providing a pathway for fluid to exit the sole of the shoe;
a flow regulator regulating the flow of said fluid through said duct to adjust the pressure in said fluid bladder;
a sensor for sensing the pressure in said fluid bladder; and
a control system in communication with said sensor and said flow regulator, said control system being capable of automatically adjusting the pressure in said bladder based on the sensing of a predetermined pressure in said bladder resulting from impact of the shoe with the traveling surface.

5,813,143
CONVERTIBLE NON-SLIP FOOTWEAR ATTACHMENT DEVICE HAVING ICE/SNOW ENGAGING CLEATS
Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976, and Jonathan Bell, Philadelphia, Pa., assignors to Michael Bell, Warrington, Pa.
Filed Dec. 20, 1996, Ser. No. 769,474
Int. Cl.[6] A43B *23/28;3/16;3/10*
U.S. Cl. 36—59 R **11 Claims**



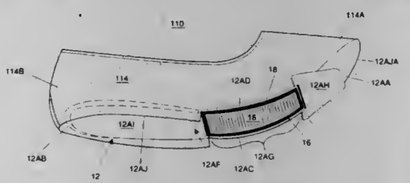
1. A convertible, non-slip, attachment device for releasable mounting on a primary footwear, the primary footwear having a sole and an upper secured thereto, the upper having a toe portion and a heel counter portion, the sole having a toe portion, a contiguous forefoot portion, and a heel portion, said attachment device being formed of a stretchable severable material and comprising a sole, toe attachment means, heel attachment means, and visible indicia for indicating the boundary of a removable portion of said attachment device which may be severed therefrom, said sole of said device having a toe portion, a contiguous forefoot portion, a heel portion and a longitudinal axis extending along said sole, said toe attachment means projecting from said toe portion of said attachment device and adapted to be brought into engagement with the toe portion of the primary footwear for releasable securement thereto, said heel attachment means comprising an upstanding member projecting upward vertically from said sole at said heel portion of said attachment device on said longitudinal axis and having a top portion, and a pair of straps extending from said forefoot portion rearwardly and upwardly at an acute angle to said longitudinal axis and merging with said top portion of said upstanding member, said top portion of said upstanding member having a pull tab projecting upwardly therefrom to facilitate engagement of the upstanding member with the heel counter portion of the primary footwear for releasable securement thereto, said sole portion of said attachment device and said heel portion of said attachment device each including plural traction-enhancing projections, said heel portion of said attachment device including said indicia, said indicia comprising a line in the form of a severable groove and including portions extending along and in the same direction as said straps and a portion extending across said upstanding member, whereupon said removable portion of said attachment device can be severed from said attachment device along said groove to produce an opening through which the heel of the primary footwear may extend and to convert said attachment device from a full sole unit to a half-sole unit.

5,813,144
HINGED ENTRY FOOTWEAR WITH INFLATABLE BRACE
Randall Prengler, 4025 Desert Mountain Dr., Plano, Tex. 75093-7337
Filed Aug. 21, 1996, Ser. No. 701,172
Int. Cl.[6] A43B *7/14;19/00*
U.S. Cl. 36—88 **21 Claims**



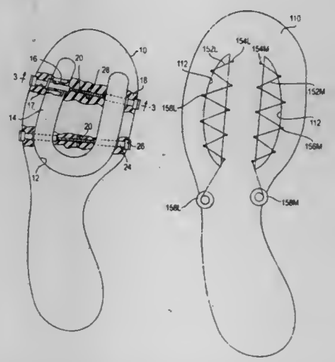
1. Footwear for supporting the ankle and foot of a wearer, comprising:
a sole member including a posterior heel part;
a lower casing formed of a generally flexible material secured to and above said sole member;
a generally flexible vertically extending anterior casing member connected to said lower casing for movement relative thereto;
a generally vertically extending posterior casing member connected to said lower casing for movement relative thereto;
fastening means for securing said casing members to each other and to a wearer's ankle; and
inflatable brace means including portions disposed between said casing members and said wearer's ankle to enhance the support of said wearer's ankle and foot with respect to said footwear, said brace means including a plurality of generally vertically extending stays interposed said casing members, said stays defining inflatable chambers operable to be pressurized with pressure fluid to aid in supporting the ankle of a wearer of said footwear, said stays being arranged in opposed pairs, each stay of a pair of stays including a distal end portion and being separated from the other stay of said pair of stays by a notch which provides clearance for a prominence of an ankle bone of the wearer of said footwear to be disposed between the stays of a pair of stays, respectively.

5,813,145
PERFECT FITTING SHOE AND METHOD OF MANUFACTURING SAME
Gregory Prober, Sceheway Garden, Lam Tin, Kowloon, Hong Kong
Filed Jul. 17, 1996, Ser. No. 680,646
Int. Cl.[6] A43B *3/26*
U.S. Cl. 36—93 **5 Claims**



1. A fitting shoe (**110**) comprising:
A) a first upper (**114**) which comprises a first upper toe (**114A**) and a first upper back (**114B**);
B) a sole **12**) which comprises:
i) an innersole (**12A**) which comprises an innersole front (**12AA**), an innersole back (**12AB**), an innersole left side (**12AC**), an innersole right side (**12AD**), an innersole top surface (**12AE**), an innersole bottom surface (**12AF**), an innersole ball area (**12AG**), an innersole toe piece (**12AH**), an innersole shankboard (**12AI**), the first upper toe (**114A**) is securely fastened to the innersole toe piece (**12AH**) forming an innersole front lasting (**12AJA**)), the first upper back (**114B**) is securely fastened to the innersole shankboard (**12AI**), and
ii) an outersole (**12B**) which comprises a outersole front (**12BA**) which is securely fastened to the innersole and upper front (**12AA**), an outersole back (**12BB**) which is securely fastened to the innersole and upper back (**12AB**), an outersole left side (**12BC**) which is securely fastened to the innersole left side (**12AC**), an outersole right side (**12BD**) which is securely fastened to the innersole right side (**12AD**), an outersole top surface (**12BE**) which is securely fastened to the innersole and upper bottom surface (**12AF**), an outersole bottom surface (**12BF**), and an outersole ball area (**12BG**); and
C) an elastic (**16**) and a tape (**18**) which is securely fastened to an inside and outside of an unfastened portion of the first upper (**114**) and securely fastened to a front edge of the innersole shankboard (**12AI**) and securely fastened to a rear edge of an innersole front (**12AH**) whereby the elastic and tape function to allow stretchability of the first upper at the ball area of a wearer to allow the shoe to be adjustable and then fixed at the point of sale to fit the wearer.

5,813,146
ARTICLE OF FOOTWEAR HAVING ADJUSTABLE WIDTH, FOOTFORM AND CUSHIONING
Larry J. Gutkowski, San Diego, Calif.; Kaia Michele Histand, Portland, Oreg.; Robert M. Lyden, Aloha, Oreg.; Ross A. McLaughlin, Lake Oswego, Oreg.; Daniel R. Potter, Forest Grove, Oreg.; John R. Robinson, Portland, Oreg., and Allen W. Van Noy, Beaverton, Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Division of Ser. No. 480,921, Jun. 7, 1995, Pat. No. 5,729,912.
This application Oct. 9, 1997, Ser. No. 947,896
Int. Cl.[6] A43B *3/26*
U.S. Cl. 36—97 **28 Claims**



1. An adjustment system for fitting a shoe to the foot of a wearer, the shoe having lateral and medial sides, an upper and a sole assembly, portions of the shoe defined by the corresponding foot areas, the sole assembly defining a periphery with lateral and medial aspects, a width and a shape of an outline of the sole assembly, said system comprising:
a material variance provided to a resilient cushioning portion of the sole assembly to permit adjustment of the width and the outline of the sole assembly; and
adjustment means for independently adjusting the width of the sole assembly at a plurality of locations between a nominal central longitudinal axis and the periphery of the sole assembly to thereby adapt the shape of the outline of the sole assembly of the shoe to the foot.

5,813,147
SNOW SHOE SCREENS
Christophe Burnet, Mercier, and Philippe Gallay, Le Nojak, both of France, assignors to Techniques Sports Loisirs, Alex, France
Filed Jan. 24, 1997, Ser. No. 788,024
Claims priority, application France, Jan. 26, 1996, 96 01201; Jun. 10, 1996, 96 07387
Int. Cl.[6] A43B *5/04*
U.S. Cl. 36—122 **19 Claims**

1. A snow shoe comprising:
a peripheral frame delimiting an interior zone;
a screen defined by a set of internal support walls, at least one of the support walls extending transversely and having a transverse profile, the support walls defining a box open toward the bottom, the support walls including at least one front wall portion extending outwardly from a top toward a front and downwardly toward a bottom and a rear wall portion extending outwardly from the top toward a rear and downwardly

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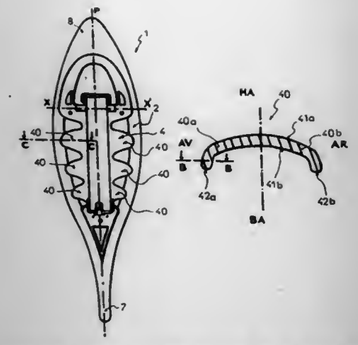
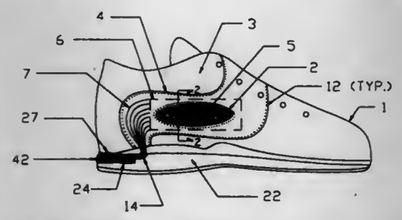


toward the bottom, such that the front and rear wall portions converge toward the top.

5,813,148
FOOTWEAR WITH OPTICAL FIBER ILLUMINATING DISPLAY AREAS AND CONTROL MODULE
Rafael J. Guerra, 1472 Avon La., #1027, N. Lauderdale, Fla. 33068
Filed Jun. 21, 1996, Ser. No. 668,405
Int. Cl.[6] A43B *23/00*
U.S. Cl. 36—137 **17 Claims**

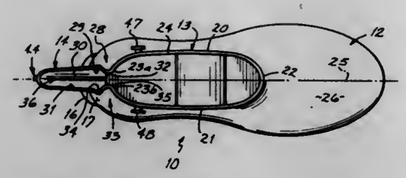


1. A shoe having an illuminating device formed integral therewith, said device comprising: a reflective substrate panel affixed to said shoe; a plurality of optical fibers having a first end and a second end with a longitudinal length therebetween with at least a portion of said longitudinal length affixed to said substrate panel; light means coupled to said optical fibers; a removable translucent cover placed in parallel arrangement with respect to said substrate panel, said optical fibers disposed between said cover and said panel, said cover including indicia; component and circuit means for activation of said light means; and battery means for supplying power to said component & circuit means and said light means, whereby said shoe is useful for advertising, decoration, and enhancing the visibility of the footwear.

5,813,149
BOOT WITH REAR EXPANSION FLAP
Douglas William Baker, Cincinnati, and Freddie L. James, Loveland, both of Ohio, assignors to 'totes', Incorporated, Loveland, Ohio
Filed Nov. 21, 1996, Ser. No. 752,576
Int. Cl.[6] A43B *11/00*
U.S. Cl. 36—138 **10 Claims**

1. A boot comprising

a sole,



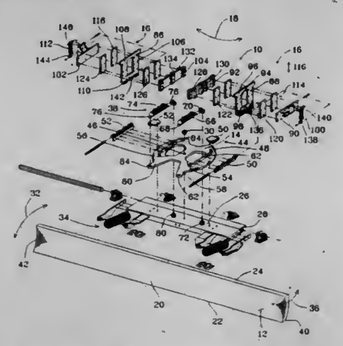
an upper connected to said sole,

a boot leg connected to said upper, said boot leg having opposed boot leg side walls,

a boot leg expansion flap having opposed flap side walls connected to said boot leg side walls along a generally vertical rear edge of said boot leg, said expansion-flap being flexibly extendable generally rearwardly of said boot leg to allow easy ingress and egress of a user's foot into and out of said boot, respectively, said expansion flap also being flexibly wrappable against one side wall of said boot leg when said boot is being worn, and

bias means connected between said expansion flap and said boot leg, said bias means causing said expansion flap to extend generally rearwardly of said boot leg when said boot is not being worn so as to make said boot accessible for ingress of a user's foot, said bias means comprising a resilient gusset connected between the front edge of each flap sidewall and its related boot leg sidewall, said gussets defining opposed fold lines on which said expansion flap may be folded to wrap said flap against either of said boot leg side walls when said boot is being worn, said resilient gussets also cooperating to cause said expansion flap to flare generally rearwardly of said boot leg when said expansion flap is not wrapped against one side wall of said boot leg.

5,813,150
SCARPER APPARATUS
Richard L. Feller, and Kevin Davis, both of Monroe, Wis., assignors to Monroe Truck Equipment Inc., Monroe, Wis.
Filed Sep. 19, 1996, Ser. No. 715,988
Int. Cl.[6] E02F *3/76*
U.S. Cl. 37—234 **1 Claim**



1. A scraper apparatus disposed beneath a truck for moving and scraping materials including ice and snow, said apparatus comprising:

a moldboard scraper disposed beneath the truck for moving and scraping the materials;

a supporting table disposed between said scraper and the truck for rotatably supporting said scraper about a first axis; and

slidable means extending from said table to the truck for permitting tilting of said table,

said slidable means including a first and a second slidable support; said first slidable support including;

a first and second plate spaced relative to each other, said plates being rigidly secured to the truck;

a first movable member and a first anti-friction means disposed between said plates and guided thereby, said first member defining a first stop means for limiting movement of said first member relative to said plates and said first anti-friction means including a first planar non-stick means disposed between the first plate and the first member and a second planar non-stick means disposed between the second plate and said first member wherein the first anti-friction means permits the slidable movement of said first member relative to the plates;

first hinge means for hingedly connecting said first movable member to said table;

a first pitch cylinder pivotally secured to said first movable member and the truck and arranged such that when the first pitch cylinder is actuated, said table is tilted relative to the truck for altering a pitch of said scraper relative to the truck;

and said second slidable support including:

a first and second guide spaced relative to each other, said guides being rigidly secured to the truck;

a second movable member and a second anti-friction means disposed between said guides and guided thereby, said second member defining a second stop means for limiting movement of said second member relative to said guides and said second anti-friction means including a first planar non-binding means disposed between the first guide and the second member and a second planar non-binding means disposed between the second guide and said second member wherein the second anti-friction means permits permitting the slidable movement of said second member relative to the guides;

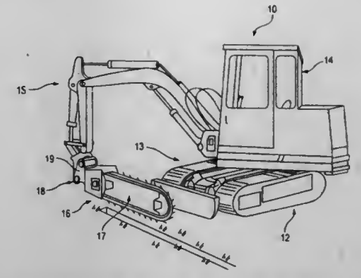
second hinge means for hingedly connecting said second movable member to said table; the second hinge means being spaced relative to the first hinge means;

a second pitch cylinder pivotally secured to said second movable member and the truck and arranged such that when the second pitch cylinder is actuated, said table is tilted relative to the truck for altering a pitch of said scraper relative to the truck; and

said scraper secured thereto relative to the truck about a second axis which is disposed normal to said first axis, said second axis extending through a front and a back of the truck such that the moving and scraping of the materials is permitted regardless of an angle of the truck relative to a level and disposition of the materials.

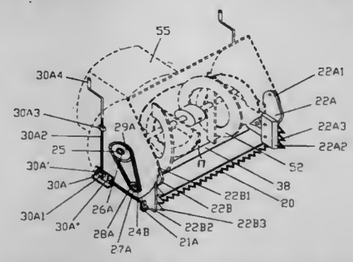
5,813,151
TRENCHING OR CUTTING APPARATUS
Anthony Leon Stephens, 3511 Pacific Highway, Springwood, Queensland, 4217, and Barry James Ketter, 2 Dorothy Street, Woodridge, Queensland 4114, both of Australia
Filed Nov. 14, 1996, Ser. No. 748,350
Int. Cl.[6] E02D *5/20*
U.S. Cl. 37—352 **9 Claims**

1. A cutting attachment for an excavator, the attachment having an excavator mounting means at a proximal end thereof, a drive mounting means adjacent to the excavator mounting means, a drive assembly having a hydraulic motor coupled to the drive mounting means, the excavator mounting means having secured thereto at an opposite side thereof the drive mounting means, the drive mounting means being configured as a pair of opposed projecting plates,



each of the plates having an inside surface and an outside surface, the plates forming spaced flanges so that the excavator mounting means and drive mounting means form a substantially open box structure, the box structure having the hydraulic motor mounted on the outside surface of one of said plates, a drive shaft of the motor extending through said one plate and between the respective inside surfaces of the opposed plates and being journalled in bearings in each plate, the drive shaft carrying a sprocket wheel located between the plates, the drive mounting means having an elongate blade rigidly secured thereto, the blade projecting from a proximal end adjacent to the drive mounting means to a distal end remote from the drive mounting means, the blade having a peripheral edge and a longitudinal axis and tapering from the proximal end to the wider distal end of the blade, the distal end being rounded and wider than the proximal end, a cutting chain travelling around the peripheral edge of the blade, the blade having an idler wheel about which the chain travels, the idler wheel being located at the distal end of the blade opposite the drive assembly, the cutting arrangement having a swivel means so that the blade can swivel about the longitudinal axis of the blade, a double acting hydraulic cylinder assembly being employed to selectively swivel the blade and the cylinder assembly being mounted so that said cylinder assembly can travel through an arcuate path.

5,813,152
SNOWBLOWER CHISEL ATTACHMENT
Arlan Weight, 1937 Jackson Ave., Bismarck, N. Dak. 58501
Filed May 29, 1997, Ser. No. 865,247
Int. Cl.[6] E02F *3/36*
U.S. Cl. 37—447 **10 Claims**



1. A snowblower chisel attachment in combination with a snowblower having a housing which includes a pair of sidewalls, a top portion, a bottom portion, a back portion having an opening therethrough and an auger mounted to an auger shaft which is rotatable disposed inside the housing and which has ends journaled through said pair of sidewalls comprising:

an oscillatable elongate blade member having a leading cutting edge for cutting into snow before the snowblower housing as said oscillatable elongate blade member oscillates forwardly and rearwardly relative to the housing;

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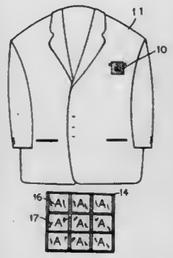
a pair of support arms each securely attached to said oscillatable elongate blade member, said pair of support arms being pivotal with respect to said sidewalls, said pair of support arms each having a front and wedge-shaped blade members secured along said front for cutting snow as said support arms pivot forwardly and rearwardly relative to the housing;

a drive means for actuating oscillating movement of said oscillatable elongate blade member; and

skid means for regulating disposition of said oscillatable elongate.

5,813,153
METHOD AND APPARATUS FOR TRACKING GARMENTS
Francesco Maglio, 567 Brownridge Drive, Thornhill, Ontario, Canada, L4J 6B6
Filed Dec. 20, 1996, Ser. No. 771,299
Int. Cl.[6] A44C *3/00*
U.S. Cl. 40—1.6 **10 Claims**



5. An apparatus for identifying and tracking pieces of clothing worn in various functions, comprising

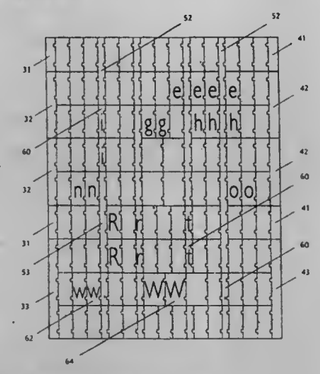
an identification pin member having a main body and an attachment member provided on said main body, said attachment member being operative for removably attaching said identification pin member to a piece of clothing, said identification pin member having a front surface provided with an attachment material,

a plurality of tag members in which each tag member has an identical appearance and has an associated attachment material provided on its rear surface, said associated attachment material being cooperative with said attachment material provided on said identification pin member for removably attaching said tag members to said front surface of said identification pin member, and said associated attachment material being operative for removably attaching said tag members to pieces of clothing worn to said social occasion,

a recording calendar member having a plurality of designated areas therein with dates of the year marked thereon, and each designated area having an information recording area and a tracking area, said recording area being operative for recording thereon said social occasion, said tracking area having an attachment material provided thereon whereby a selected tag member is removably attachable thereon;

wherein said attachment material is a fuzzy fabric material, and said associated attachment material has a plurality of hook-shaped clinging fibers therein operative for attaching to said fabric material removably.

5,813,154
MAGNETIC DISPLAY FORMAT SYSTEM FOR ACCOMODATION OF ALPHANUMERIC CHARACTER WIDTH DIFFERENCE
Wesley Ralph Wilford, P.O. Box 1965, Brentwood, Tenn. 37024-1965
Filed Dec. 20, 1996, Ser. No. 771,068
Int. Cl.[6] G09F *7/02*
U.S. Cl. 40—618 **15 Claims**



7. A sign construction kit including:

a. a plurality of individual sign pieces;

b. each sign piece being a relatively flat, thin structure having a perimeter and opposing sides;

c. one of said opposing sides of each sign piece being designed for attachment to a surface on which a sign is to be constructed and the other of said opposing sides of each sign piece having indicia imprinted thereon, said indicia being selected from the group consisting of alphabetic letters, numbers, symbols and blanks;

d. each indicia being assigned a width, with each width being relatively a multiple of a basic select width dimension and there being at least two different widths assigned;

e. each sign piece having a width with the width of the sign pieces being a multiple of said basic select width dimension and there being at least two different widths of sign pieces;

f. the indicia on each sign piece being selected such that the assigned width of said indicia matches the relative corresponding width dimension of said sign piece;

g. the perimeter of said sign pieces including a top, a bottom and opposing ends with the opposing ends, and only the opposing ends, of said sign pieces including tabs and indentations whereby each of said sign pieces can be attached to an adjacent sign piece; and

h. a series of border pieces having tabs and indentations wherein said border pieces can be connected to secure rows of said sign pieces within a frame.

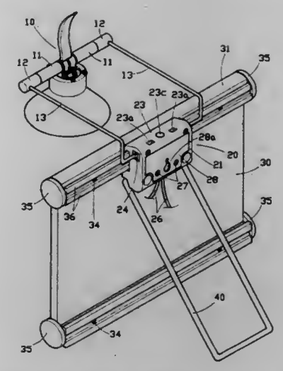
5,813,155
PICTURE FRAME AND LAMP ARRANGEMENT
Wei-Hong Shen, 6F, No. 416, Sec. 4, Jen-Ai Rd., Taipei, Taiwan
Filed Apr. 15, 1997, Ser. No. 834,307
Int. Cl.[6] A47G *1/06*
U.S. Cl. 40—715 **7 Claims**

1. A combined display frame and lamp system comprising:

(a) a display frame assembly;

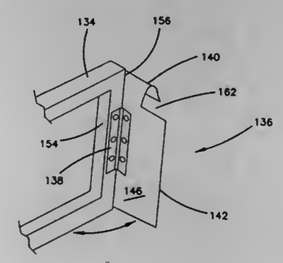
(b) a mount assembly displaceably coupled to said display frame assembly for substantially independent displacement relative thereto;

(c) a support member pivotally coupled to said mount assembly for supporting said mount and said display frame assemblies; and,



(d) a lamp holder assembly adjustably coupled to said mount assembly.

5,813,156
CONNECTORS, DISPLAY FRAME APPARATUS AND METHOD OF USE
John R. Maticko, Fairfax, Va.; David S. Chapin, Raleigh, N.C.; Arthur G. Carr, Washington, D.C., and Scott A. Boothby, Wooster, Ohio, assignors to Nomadic Structures, Inc., Springfield, Va.
Filed Feb. 14, 1997, Ser. No. 799,353
Int. Cl.[6] G09F *7/22*
U.S. Cl. 40—757 **3 Claims**



1. An apparatus for displaying a banner, the apparatus comprising:

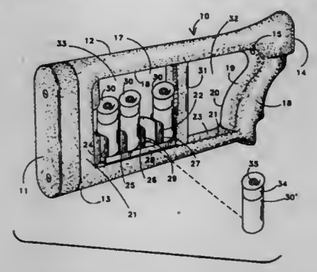
left and right end pieces;

first left and right brackets respectively secured to the left and right end pieces, the first left and right brackets including guide portions having substantially planar guide surfaces, and hook portions which are connected with the guide portions and which are spaced-apart from the planar guide surfaces;

at least one hinge that pivotally connects at least one of the first left and right brackets to at least one of the left and right end pieces, the at least one hinge having a pivot axis extends along the at least one left and right end piece; and

a plurality of substantially straight cross-members extending between the left and right end pieces, the left and right end pieces and the cross-members being adapted to form a generally rectangular first display frame.

5,813,157
SHOTGUN STOCK WITH SHELL HOLDER
Barry R. Scott, 41162 Montelimar Crt., Murrieta, Calif. 92562, and Richard D. Wade, 1014 W. Woodcrest Ave., Brea, Calif. 92821
Continuation-in-part of Ser. No. 55,659, Jun. 10, 1996, Pat. No. Des. 382,037. This application Apr. 21, 1997, Ser. No. 845,220
Int. Cl.[6] F41C *23/00*
U.S. Cl. 42—71.01 **10 Claims**



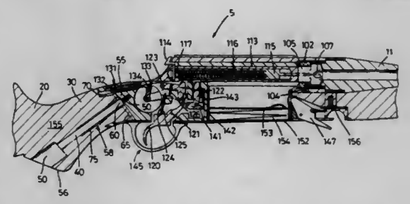
1. A shotgun stock with a shell holder comprising:

a shotgun stock having a butt, a top, a bottom, a right side and a left side, and a front which includes means for attachment to a shotgun barrel assembly;

an opening through said stock from said right side to said left side creating an open passageway from said right side to said left side, said opening having an opening top, an opening right side coincident with the right side of the stock, an opening left side coincident with the left side of the stock, an opening front edge separated from the front of the stock, and an opening back edge separated from said butt; and

a shotgun shell holder completely contained between said opening so that it does not extend outwardly from the shotgun stock.

5,813,158
FIREARMS
Hugh Alexander Campbell, Inverness, and Ian Fraser Thompson, Cromarty, both of United Kingdom, assignors to Thompson & Campbell Limited, United Kingdom
Division of Ser. No. 719,131, Sep. 24, 1996. This application Mar. 31, 1997, Ser. No. 828,641
Claims priority, application United Kingdom, Sep. 28, 1995, 9519963
Int. Cl.[6] F41A *21/00*
U.S. Cl. 42—75.03 **18 Claims**



1. A rifle which includes a stock having a forestock and a buttstock, and an action, the buttstock being provided with a first hole having first and second ends, the second end opening onto a seat portion adapted to receive the action in fixed relationship to the stock, the stock further including a bedding plate provided on the seat portion of the stock, which bedding plate extends around the second end of the first hole to provide a mounting surface

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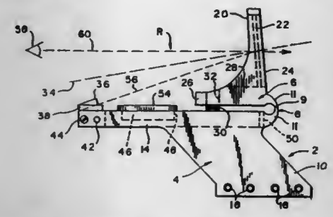
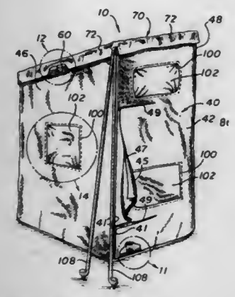
which abuts the action, the buttstock being releasable and threadably connected at its foremost end to the action by a bolt extending through the bedding plate and being retained in the first hole.

5,813,159
WIDE FIELD OF VIEW REFLEX GUNSIGHT
Ira Mark Kay, Elway Hall, Rte. 2, Box 70, Warrenton, Va. 22186-9802, and Clifford E. McLain, 7816 Manor House Dr., Fairfax Station, Va. 22039
Continuation of Ser. No. 34,839, Mar. 19, 1993, Pat. No. 5,369,888, which is a continuation-in-part of Ser. No. 3,703, Jan. 13, 1993, abandoned. This application Jul. 13, 1995, Ser. No. 481,386
Int. Cl.[6] F41G *1/14;1/26*
U.S. Cl. 42—103 **13 Claims**



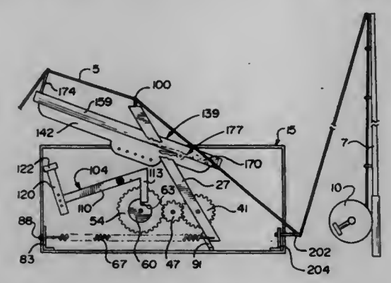
1. A gunsight, comprising:
a) a frame for being secured to a gun body;
b) a lens operably secured to said frame;
c) a light source secured to said frame for projecting an image on said lens;
d) said light source and said lens being positioned relative to each other and to the gun barrel axis such that the image projected onto said lens is reflected to a user's eye who then lines up the image onto a target to take aim; and
e) said frame including first and second opposed leg portions having a U-shape for receiving the gun body therebetween, thereby to secure said gunsight to the gun body.

5,813,160
PORTABLE HUNTING BLIND
Cary W. Thoelke, 2617 N.E. 12th Ave., Pompano Beach, Fla. 33064
Filed Oct. 29, 1996, Ser. No. 739,628
Int. Cl.[6] A01M *31/02*
U.S. Cl. 43—1 **6 Claims**



1. A hunting blind apparatus comprising:
a collapsible frame structure including
an upper frame assembly structured and disposed to define a closed loop,
a lower frame assembly structured and disposed to define a closed loop,
said upper and lower frame assemblies each including opposing, generally U-shaped sections, each of said U-shaped sections having a pair of opposite free end zones,
interconnecting means for removably interconnecting said free end zones to opposing ones of said free end zones of said generally U-shaped frame sections to define said closed loop,
vertical support means for supporting said upper frame assembly in spaced relation above said lower frame assembly and including a plurality of post assemblies having opposite distal ends structured and disposed for removable interconnection with a corresponding one of said upper and lower frame assemblies,
said upper and lower frame assemblies including a continuous track therealong,
a curtain defining side walls for surrounding an interior of said hunting blind apparatus includes a top edge, a bottom edge, and opposite vertically disposed edges,
a roof panel having surrounding peripheral edge zones structured to drape over said upper frame assembly for removable attachment to said top edge of said curtain, thereby covering an opening through said closed loon of said upper frame assembly,
said post assemblies including a first set of post assemblies and a second set of post assemblies, said first set having a greater length than said second set so as to support said upper frame assembly in an angled orientation relative to said lower frame assembly, thereby facilitating run off of rain water, snow and other debris which falls on said roof panel,
a plurality of traveler assemblies removably attached to said top and bottom edges of said curtain at spaced intervals therealong, each of said traveler assemblies including roller elements structured and disposed for travel along said continuous track of said upper and lower frame assemblies so that said curtain can be moved and arranged to surround and enclose said interior of said hunting blind apparatus,
reinforcing means on said top edge and said bottom edge of said curtain for reinforced attachment of said plurality of traveler assemblies thereto,
said curtain being provided with at least one window opening having a closure flap which includes means for removably securing said closure flap in covering relation to said window opening, and
means on said frame structure for securing said frame structure to a ground surface.

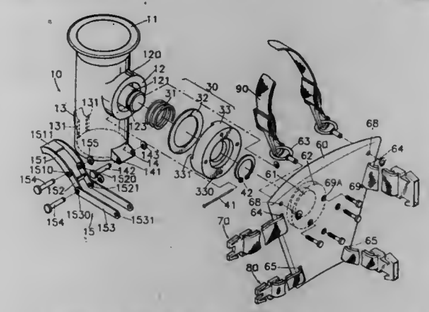
5,813,161
AUTOMATIC FISH HOOK SETTING ASSEMBLY
Hyunsoo Yai, 9003 Scott St., Springfield, Va. 22153
Filed Feb. 6, 1997, Ser. No. 795,558
Int. Cl.[6] A01K *91/10*
U.S. Cl. 43—15 **19 Claims**



1. An automatic fish hook setting assembly comprising:

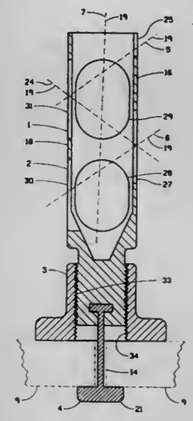
a first setting member movable between a set position and a hooking position;
an element biasing said first setting member towards said hooking position;
a second setting member supported for movement between a latching position wherein said second setting member is interconnected with said first setting member in order to retain said first setting member in said set position and an unlatching position wherein said second setting member releases said first setting member;
a third setting member movable between loaded and unloaded positions with said third setting member exerting an unlatching force upon said second setting member when shifted to said unloaded position; and
at least one weight transferring member supported by said third setting member for movement relative to said third setting member, wherein said first and third setting members are adapted to be placed in contact with a fishing line having a hook to be set when said first setting member is in said set position, said second setting member is in said latching position and said third setting member is in said loaded position such that, upon tugging on the fishing line by a fish with a force causing shifting of said at least one weight transferring member relative to said third setting member beyond a threshold amount, said third setting member is forced to shift from said loaded position to said unloaded position which causes said second setting member to assume said unlatching position thereby permitting the first setting member to jerk the fishing line while moving to said hooking position in order to automatically set the hook.

5,813,162
PORTABLE HANDSFREE FISHING ROD SUPPORTING DEVICE
Steven Tse, 4Fl. 27, Lane 160, Hsin Sheng S. Rd., Sec. 1, Taipei, and Meng Chin Tseng, 207, Te Fang Rd., Sec. 3, Ta Li City,Taichung Hsien, both of Taiwan
Filed Jan. 21, 1997, Ser. No. 784,594
Int. Cl.[6] A01K *97/10*
U.S. Cl. 43—21.2 **4 Claims**



1. A fishing rod supporting device for use by a fisherperson for hands-free operation of a fishing rod comprising:
(a) a cylindrical holder having a hollowed interior and a top open end and a bottom open end, a bottom rim of said bottom open end includes a locking member and an ear with a connecting hole;
(b) a linked member is provided on said bottom rim of said cylindrical holder to selectively close and open said open bottom end of said cylindrical holder, said linked member comprises
(i) a top link having a first end and a second end, said first end of said top link includes a handle means,
(ii) an intermediate link having a first end and a second end, said first end of said intermediate link is pivotally linked with said second end of said top link, and
(iii) a bottom link having a first end and a second end, said first end of said bottom link is pivotally linked to said second end of said intermediate link, said second end of said bottom link is pivotally connected to said ear on said cylindrical holder, and wherein
said handle means selectively engages said locking member on said cylindrical holder so as to allow said intermediate link to act as a support on said bottom open end of said cylindrical holder,
(c) a cushion pad including at least a pair of belts to strap said cushion pad to a body of the fisherperson, and
(d) a coupler to connect said cylindrical holder to said cushion pad, said coupler allows said cylindrical holder to rotate within a given angular range.

5,813,163
MUTLIDIRECTIONAL ROD, UMBRELLA AND TOOL HOLDING DEVICE
Edward D. Dysarz, 11423 Triola Ln., Houston, Tex. 77072
Filed Jun. 23, 1997, Ser. No. 880,712
Int. Cl.[6] A01K *97/10*
U.S. Cl. 43—21.2 **4 Claims**



1. A device to hold at least one fishing rod or multiple fishing rods or tools on a dock, deck, or pier with planks or boards comprising:
a rod holder with a first end, a second end, an inside, an outside, a first side, a second side, a third side, and a fourth side wherein at least one hole is formed in said first side and at least one notch and one hole is formed in said third side, and at least one notch and one hole is formed in said second side and at least one hole is formed in said fourth side and wherein said one hole formed in said first side is closer to said second end of said rod holder than said hole formed in said third side and wherein said hole formed in said second side is closer to said first end of said rod holder than said hole formed in said fourth side and wherein said second end of said rod holder has threads formed on the outside;
a imbed H bar with a first end and a second end wherein said first end of said imbed H bar is imbedded into said second end of said rod holder and said second end of said imbed H bar is formed into an inverted T and wherein said second end of said imbed H bar extends past said second end of said rod holder;
a base member with a first end and a second end and with an inside and an outside and wherein said inside has threads and wherein said threads are compatible with said threads formed on said second end of said rod holder and wherein said base member is disposed over said second end of said rod holder and said threads formed on said rod holder mesh with said

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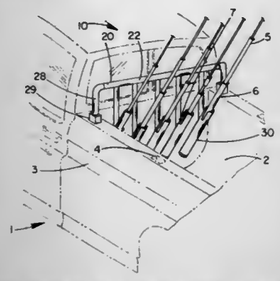
threads formed on the inside of said base member and wherein said inverted T is inserted into a gap between said planks forming said dock, pier, or deck and wherein said inverted T is below the underside of said planks and said inverted T is rotated until said inverted T is below said underside of said planks and said base member is rotated about said lower end of said rod holder wherein said base member is forced into the topside of said planks and said inverted T is forced into said bottom side of said planks thus locking said device to said planks of said dock, pier, or deck wherein said fishing rod is inserted into said hole on said third side and said hole on said first side thereby holding at least one said fishing rod at an angle.

5,813,164
FISHING ROD HOLDER
Joseph Liberto, 1334 Sycamore Ave., Annapolis, Md. 21403
Filed Sep. 11, 1997, Ser. No. 927,340
Int. Cl.[6] A01K *97/10*
U.S. Cl. 43—21.2 **12 Claims**



1. A fishing rod holder for a vehicle having a load bed, said load bed having a pair of spaced apart side walls, each said side wall having a plurality of post holes in said top edge being included therein, said fishing rod holder comprising:

a support structure, said support structure including an elongate horizontal member for bridging across said load bed and having opposite ends, and a pair of mounting members mounted to the horizontal member at opposite ends of said horizontal member, each said mounting member having a mounting end, each said mounting end being adapted for insertion into one of said plurality of post holes on opposite side walls of said load bed;

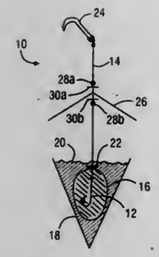
an extension member having opposite first and second ends with the first end mounted to said horizontal member, said extension member depending from said horizontal member for positioning the second end of said extension member between said side walls of said load bed; and

a tubular rod holder member being mounted on the second end of said extension member, said rod holder member being for holding a handle of a fishing rod, wherein the extension member is adapted to position the tubular rod holder between the side walls of the load bed below the top edges of the load bed to reduce the vertical height protrusion of a fishing rod mounted in said rod holder.

5,813,165
BIODEGRADABLE SNAKE TRAP
Franklin Wayne Dougherty, Sr., 6020 Longwood La., Beaumont, Tex. 77707
Filed May 6, 1997, Ser. No. 852,056
Int. Cl.[6] A01K *83/06*
U.S. Cl. 43—58 **18 Claims**

1. An apparatus for trapping snakes, the apparatus comprising:

a) bait for attracting snakes;



b) a hook at least partly embedded in the bait;

c) a line having a first end and a second end, the first end being attached to the hook and the second end extending outside the bait and attached to an attachment device; and

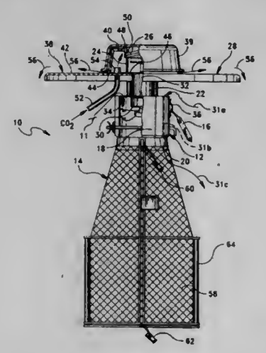
d) a frozen fluid encasing the bait.

12. A method of trapping snakes, the method comprising:

a) providing a snake trap comprising a hook embedded in an egg and providing an attachment device connected to the hook; and

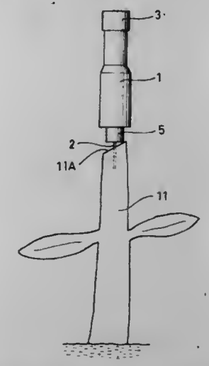
b) releasing the snake trap from an aircraft flying over an area in which snakes are generally located so that the snake trap drops into the area.

5,813,166
TRAP SYSTEM FOR REDUCING THE ENTRY OF FLYING INSECTS TO A DEFINED AREA
Bruce E. Wigton, Jamestown, and Mark H. Miller, Hope, both of R.I., assignors to American Biophysics Corp., Jamestown, R.I.
Filed Jan. 31, 1995, Ser. No. 381,545
Int. Cl.[6] H01M *1/06*
U.S. Cl. 43—107 **5 Claims**



1. A trap system for reducing the entry of flying insects into a predetermined area which is defined by a continuous perimeter extending around said predetermined area, said trap system comprising a plurality of insect traps operable for attracting and capturing a plurality of said insects, said plurality of traps being positioned at predetermined spacings around said continuous perimeter of said predetermined area such that said plurality of spaced traps cooperate to form a barrier for preventing said flying insects from crossing over said perimeter into said predetermined area.

5,813,167
GRAFTING METHOD AND DEVICE THEREFOR
Seiji Hoshino, Kanagawa; Takeo Tsujimoto, Shiga, and Takamitsu Ohtani, Kyoto, all of Japan, assignors to Takii Shubyo Kabushiki Kaisha, Kyoto; T.S. Plant Science Institute Co., Ltd., and Dai-Ichi Ceramo Ltd., both of Shiga, all of Japan
Filed Mar. 22, 1995, Ser. No. 408,680
Claims priority, application Japan, Mar. 24, 1994, 6-053799
Int. Cl.[6] A01G *1/00*
U.S. Cl. 47—6 **24 Claims**



1. A grafting device for inserting a bar member into a stem of a stock, comprising:

a chuck for holding the bar member;

a tubular clamp having a hole in a front end thereof for the bar member to pass therethrough;

said tubular clamp having said chuck disposed therein in alignment with said hole in said front end of said tubular clamp such that said bar member may pass through said chuck and through said hole, said chuck being axially movable within said tubular clamp;

a tubular pressing member disposed axially movable relative to said tubular clamp for effecting axial movement of said chuck relative to said tubular clamp;

chuck biasing means for biasing said chuck rearwardly away from said front end of said tubular clamp; and

means for opening and closing said chuck in response to said axial movement of said chuck relative to said tubular clamp.

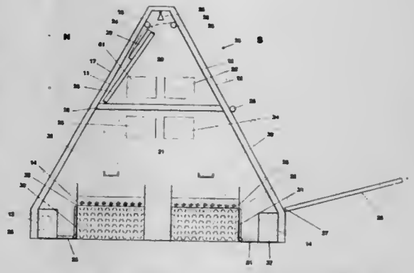
5,813,168
ENVIRONMENTALLY CONTROLLED GREENHOUSE
Thomas Clendening, Yorktown, Ind., assignor to McColliberry Farms, Inc., Yorktown, Ind.
PCT No. PCT/US93/04010, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO93/21755, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 29, 1993, Ser. No. 313,186
Int. Cl.[6] A01G *9/00*
U.S. Cl. 47—17 **6 Claims**

1. A method for controlling the environment within a greenhouse, comprising the steps of:

(a) providing a greenhouse having walls defining an interior space and exterior edges, a heat exchanger and a hydroponic plant growing means, the heat exchanger having an upper surface, the hydroponic plant growing means positioned above the upper surface of the heat exchanger, and the heat exchanger comprising:

(i) a plurality of spaced water-impermeable flow means having first and second opposing ends defining a length of the flow means, a width of the flow means being less than the length of the flow means, each flow means comprising

a water inlet end adaptive to receive water, and



a water outlet means adaptive to discharge water, and

each flow means being disposed such that gravity may cause water to flow from the inlet end toward the outlet means;

(ii) an air inlet and an air outlet, positioned such that air flowing from the air inlet to the air outlet moves between each of said flow means, wherein each of said flow means further comprises an interior passageway in which water flows, and wherein air flowing from the air inlet to the air outlet between the flow means does not contact water in said interior passageway, and

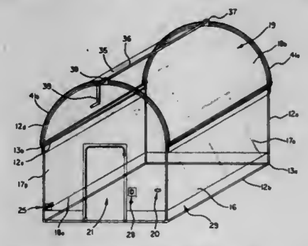
(iii) a fan adapted to move air from the air inlet toward the air outlet, the fan positioned at one end of the flow means and oriented to move air toward an opposite end of the flow means;

(b) providing a water source to the water inlet end;

(c) draining water into the water outlet means; and

(d) forcing air between the flow means such that the temperature of the air at the air outlet is closer to the temperature of provided water than the air at the air inlet.

5,813,169
PORTABLE GREENHOUSE CONSTRUCTION
Deanna L. Engerman, 13033 Brookside Dr. NE., Aurora, Oreg. 97002
Filed Apr. 29, 1997, Ser. No. 846,555
Int. Cl.[6] A01G *9/00*
U.S. Cl. 47—17 **17 Claims**



1. A portable greenhouse construction, comprising:

a floor;

side walls being connected at a base end of said side walls to the floor, said side walls extending upwardly from the floor;

end walls being connected at a base end of said end walls to the floor, the end walls extending upwardly from the floor;

a roof extending between the side walls and end walls, said roof comprising:

a pair of translucent flexible roof panels for selectively covering said interior space, said flexible roof panels each having opposite side edges, said side edges including an inner edge and another edge, each of said roof panels extending between a half of the arcuate top edge, said end walls being for covering an opposite side of said interior

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space, said flexible panels meeting at the uppermost vertical top of the arcuate top edge;

an actuator rod extending between the end walls and being positioned at the vertical top of the arcuate top edge of the end walls, the inner edge of each of said roof panels being coupled to the actuator rod such that rotation of said actuator rod wraps said flexible roof panels about said rod to expose the interior space without moving said side walls out of position;

each roof panel further having a respective weight member coupled to the outer edge of each said roof panel opposite said actuator rod, said weight members being for biasing said respective roof panels into a closed position covering said interior space;

the floor, side walls, end walls, and roof defining an interior space;

the side walls, the end walls, and the roof being made from a translucent material; and

ballast means connected to the base end of each of the side walls and the end walls to stabilize the greenhouse on the ground.

5,813,170

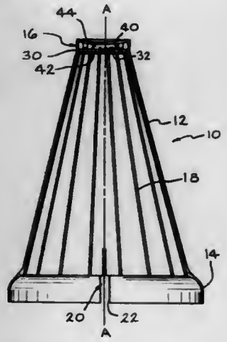
DIRECT SEEDING SHELTER AND METHOD FOR SEEDING

Todd Friesner, 411 W. Second St., Perrysburg, Ohio 43551, and Jeff McKnight, Thunder Bay, Canada, assignors to Todd Friesner, Perrysburg, Ohio

Filed Nov. 4, 1996, Ser. No. 740,842

Int. Cl.[6] A01G *13/00*

U.S. Cl. 47—26 **20 Claims**



1. A direct seeding shelter comprising

a substantially continuous side wall defining an interior portion of the shelter,

a base for engaging soil at a planting site and

a top, said top comprising

a generally cylindrical portion having an inside cylindrical surface, and

a displaceable cover which is operable, in a first position, to prevent a seed from passing from the interior of the shelter to the exterior of the shelter, through the shelter top and

a seed retainer operable to frictionally engage said inside cylindrical surface and to define, with said displaceable cover in said first position, a seed retaining pocket.

5,813,171

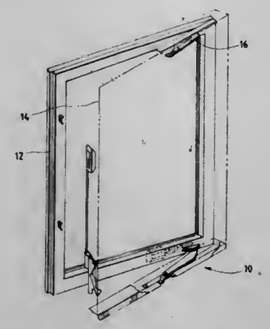
INTEGRATED POWER WINDOW OPERATOR

Stephen M. Piltingsrud, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Nov. 18, 1996, Ser. No. 751,584

Int. Cl.[6] E05F *15/00*

U.S. Cl. 49—139 **19 Claims**



1. An assembly for opening and closing a window sash from and against a window frame, the assembly comprising:

a motor mountable to the window sash, said motor having an output drive shaft;

an output arm having one portion pivotally connectable to the window sash and a second portion operably connectable to the window frame;

means for operably connecting said motor drive shaft to said output arm for controlling pivotal movement of said output arm in relation to the sash, said connecting means including a first transmission element drivably connected to the support arm and a second transmission element drivably connected to the output drive shaft; and

manually operable means for selectively moving one of said first and second transmission elements relative to the other between

a first position wherein the first and second elements are fixed together against relative movement by a non-slip connection to drivably connect said drive shaft to said output arm, and

a second position wherein the first and second elements are secured together for selected movement relative to each other to drivably disconnect said drive shaft from said output arm.

5,813,172

STRUCTURAL INFLATABLE WALL PANELS

Mark F. McNally, 50 Samoset St., Plymouth, Mass. 02360

Filed Apr. 4, 1997, Ser. No. 833,327

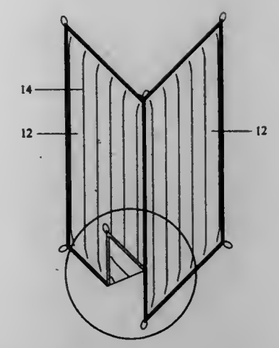
Int. Cl.[6] E04H *15/20*; E04C *2/02*

U.S. Cl. 52—2.25 **6 Claims**

1. A structural wall panel comprising:

an inflatable pad having a border along edges of said pad, each border having a top side and a bottom side;

a first fastener material secured along the entire periphery of said top side of the border;



a second fastener material secured along the entire periphery of said bottom side of the border.

5,813,173

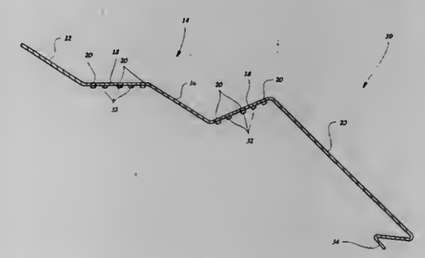
GUTTER PROTECTOR

Donald W. Way, Sr., 9225 Kings Canyon Dr., Charlotte, N.C. 28210

Continuation of Ser. No. 580,133, Dec. 28, 1995, abandoned. This application Apr. 25, 1997, Ser. No. 845,697

Int. Cl.[6] E04D *13/00*

U.S. Cl. 52—12 **7 Claims**



1. An improved gutter protector of the type having an inner edge portion positionable in contact with a row of shingles on a roof, a draining surface portion with a plurality of sequential, laterally extending sections, at least one of said sections being imperforate and at least one other of said sections extending from said at least one imperforate section at an outward inclination with respect thereto and having a plurality of perforations for draining water therethrough, said draining surface portion extending from the inner edge portion, an outer end portion extending from the draining surface portion for engagement with an outer edge of a gutter having an elongated extent wherein the improvement comprises said perforations being formed by indented strips separated from said draining surface portion along side edges thereof and attached to said draining surface portion at ends thereof, thereby forming opposing openings extending in a generally perpendicular relationship with said draining surface portion to prevent elongate debris and debris larger than said openings from entering the gutter.

5,813,174

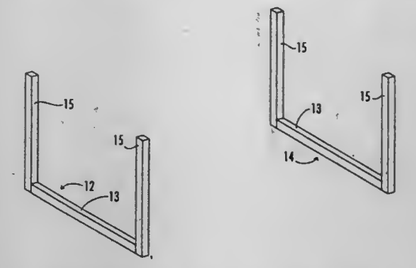
CLOSET VAULT

James E. Waller, 2100 Brickell Ave. HCR 77, Box 161, Altamont, Tenn. 37301

Filed Mar. 28, 1996, Ser. No. 623,408

Int. Cl.[6] E04H *1/00*

U.S. Cl. 52—79.1 **26 Claims**



1. A pre-fabricated metal closet vault including multiple pre-fabricated, sized and shaped elements designed to facilitate on-site assembly, including:

a. multiple framing elements, each framing element constructed of metal and having two free ends;

b. connectors connecting facing free ends of adjacent framing elements to form a frame defining a ceiling, floor and sides, said ceiling, floor and sides connected to form a closet vault having an inside area;

c. elongated metal panels attached to said frame in side-by-side, juxtaposed relationship to form a metal ceiling, side walls, and floor of said closet vault;

d. said panels having an open center defined by opposing channel arms with said channel arms sized and shaped whereby each channel arm mates with the channel arm of an adjacent panel and with said frame;

e. said channel arms providing access to said open center of said panels with each panel connected to an adjacent panel by fasteners attached from the inside area defined by the side walls, ceiling and floor of the closet vault; and

f. a door opening in one of said walls of said closet vault.

5,813,175

APPARATUS AND METHOD FOR PROCTECTING BUILDING FROM EARTHQUAKES

Minoru Hiragaki, Shimizu, Japan, assignor to Air House Company, Shimizu, Japan

Filed Dec. 30, 1996, Ser. No. 775,200

Claims priority, application Japan, Jan. 12, 1996, 8-004040; Jun. 10, 1996, 8-147259

Int. Cl.[6] E04B *1/98*

U.S. Cl. 52—167.1 **11 Claims**

1. A system for supporting walls of a building with a building frame constructed of upper and lower horizontal structural members and spaced vertical structural members, which create rectangular spaces for the walls, comprising:

top and bottom mounting fixtures adapted to be fixed to said upper and lower horizontal structural members and having mounting holes therein;

wall panels adapted to be inserted into said spaces to form gaps relative to the top and bottom mounting fixtures;

a multiple number of female fixtures embedded in said wall panels spaced apart from each other;

vibration absorbers, each being comprised of a first vibration-absorbing material which is placed in one gap formed between one of said top and bottom mounting fixtures and one of said wall panels and a second vibration-absorbing material which is inserted into one of said mounting holes; and

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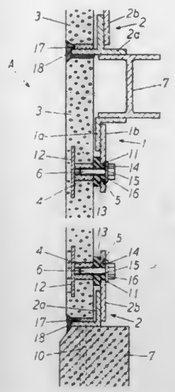


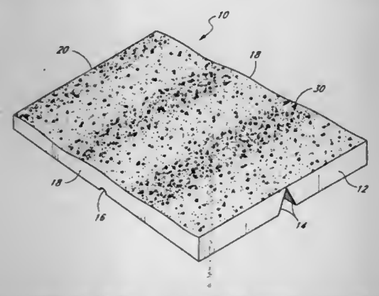
fixing members secured in said female fixtures and to said top and bottom mounting fixtures, each fixing member passing through a through-hole bored substantially at a central position of the vibration absorbers.

5,813,176

ASPHALTIC FOAM

Casey G. Tzeng, Irvine, and George F. Thagard, III, Coto De Caza, both of Calif., assignors to Fontana Paper Mills, Inc., Fontana, Calif.

Filed Jun. 7, 1995, Ser. No. 486,390
Int. Cl.[6] E04B *7/00*
U.S. Cl. 52—198 **16 Claims**



1. A ridge cap having a lower surface adapted to be placed in contact with a roof of a building and an upper surface, said upper surface having granules embedded therein, said ridge cap further comprising:

a longitudinal axis having a front end and a back end, wherein said ridge cap further comprises at least two sides located axially distal of said longitudinal axis; and

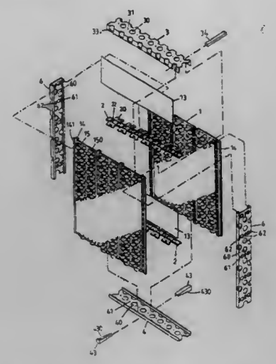
an elastomeric strip along said longitudinal axis, said elastomeric strip and said sides being of unitary construction, said sides being of a different material than said elastomeric strip, said material of said sides being more rigid than the material of said elastomeric strip.

5,813,177

BUILT-UP PARTITION WALL FRAMEWORK SYSTEM

Chiang-Su Wu, No. 202, Jen-Ai 2nd Street, Kaohsiung, Taiwan

Filed Oct. 7, 1997, Ser. No. 946,376
Int. Cl.[6] E04B *2/32*
U.S. Cl. 52—238.1 **1 Claim**



1. A built-up partition wall framework system for building up partition wall frameworks in a building, comprised of a plurality of main wall panels, a plurality of main wall panel coupling hook plates, a plurality of top channel rails, a plurality of bottom channel rails, a plurality of channel-like latch pins, a plurality of wedge blocks, a plurality of first side covers, a plurality of second side covers, a plurality of mounting supports, a plurality of T-wall external coupling hook plates, a plurality of wall end coupling hook plates, a plurality of internal angle coupling hook plate, a plurality of external angle coupling hook plates, a plurality of wall to wall coupling hook plates, and a plurality of filler plates, wherein:

each of said main wall panels comprises a plurality of longitudinal channel ribs arranged in parallel, rows of longitudinally and equally spaced projecting strips respectively raised in the longitudinal channel ribs, the projecting strips of said main wall panels having a respective smoothly curved safety end, parallel rows of longitudinally spaced coupling holes formed between said projecting strips, and reinforcing flanges perpendicularly raised from said coupling holes in reversed directions, said reinforcing flanges having a respective smoothly curved safety end;

said main wall panel coupling hook plates are elongated hook plates, each of said main wall panel coupling hook plates comprising a plurality of longitudinally spaced circular holes, two parallel reinforcing ribs longitudinally disposed at two opposite sides of said elongated hook plate, and a plurality of hook strips symmetrically extending outwardly from said two opposite sides in reversed directions and adapted for hooking in the coupling holes of said main wall panels for joining a pair of said main wall panels together, said hooked strips having a respective smoothly curved front end;

said top channel rails are adapted for fastening to joined said main wall panels at a top side, each of said top channel rail comprising a plurality of longitudinally spaced circular wire holes corresponding to the circular holes of said main wall panel coupling hook plates for inserting electrical wires, a plurality of small mounting holes for fastening said top channel rail to a ceiling wall by steel nails, and a plurality of rectangular side holes symmetrically disposed at two opposite lateral sides of said top channel rail;

said bottom channel rails are adapted for fastening to joined said main wall panels at a bottom side, each of said bottom channel rails comprising a plurality of longitudinally spaced circular wire holes corresponding to the circular holes of said main wall panel coupling hook plates for inserting electrical wires, and a plurality of small mounting holes alternatively spaced by the circular wire holes for fastening said bottom channel rail to a floor wall by steel nails;

said channel-like latch pins are adapted for fastening to the rectangular side holes of said top channel rails and the coupling holes of said main wall panels for fixing said top channel rails and said main wall panels together;

said wedge blocks are shaped like a right-angled triangle, having transverse teeth on the respective hypotenuse, said wedge blocks being matched in pair by engaging the respective transverse teeth of one wedge block with another, each pair of matched wedge blocks for being sandwiched in between one bottom channel rail and the floor wall;

said first side covers are adapted for fastening to two joined said main wall panels, wherein said main wall panels are laterally cut and have the respective laterally disposed longitudinal reinforcing ribs removed at lateral sides, each of said first side covers comprising a plurality of big circular holes and small circular holes for inserting electrical wires, a plurality of hooks symmetrically and perpendicularly raised from two opposite lateral sides and adapted for engaging and fastening to the corresponding coupling holes of each two joined and cut said main wall panels at said lateral sides, and three longitudinal rows of equally spaced rectangular holes formed between said big and small circular holes;

said second side covers are shaped like a channel bar having two longitudinal flanges and adapted for engaging and fastening to the longitudinal reinforcing ribs of each two joined said main wall panels at lateral sides, each of said second side covers comprising a plurality of big circular holes and small circular holes for inserting electrical wires, and three longitudinal rows of equally spaced rectangular holes disposed between said big and small circular holes;

said mounting supports are shaped like a channel bar and adapted for securing said second side covers to a vertical wall, each of said mounting supports comprising longitudinal rows of equally spaced projecting strips for binding cement to the framework, the projecting strips of said mounting supports having a respective smoothly curved safety end, a plurality of longitudinally spaced small holes in the middle of said channel bar adapted for fastening to a vertical wall of the building by steel nails, two longitudinal rows of rectangular holes at two opposite sides of said channel bar adapted for connecting to the rectangular holes of said second side covers by said wall to wall coupling hook plates;

said T-wall external coupling hook plates are flat coupling plates adapted for connecting two second side covers together, each of said T-wall external coupling hook plates comprising reversed pairs of projecting strips for binding cement to the framework, the projecting strips of said T-wall external coupling hook plates having a respective smoothly curved safety end, a plurality of longitudinally extended reinforcing ribs, and a plurality of hooks raised extending outwardly from two opposite lateral sides of said T-wall external coupling hook plates and adapted for fastening to the rectangular holes of said second side covers;

said wall end coupling hook plates are shaped like a channel bar and adapted for fastening to said second side covers, each of said wall end coupling hook plates comprising a plurality of projecting strips for binding cement, the projecting strips of said wall end coupling hook plates having a respective smoothly curved safety end, and a plurality of hooks perpendicularly raised from two opposite lateral sides and adapted for fastening to the rectangular holes of said second side covers and the rectangular holes of said first side covers respectively;

said internal angle coupling hook plates are angled coupling hook plates adapted for fastening two built-up partition wall frameworks at right angles or perpendicularly, each of said internal angle coupling hook plates comprising two elongated plates formed angularly with each other, said elongated plates having reversed pairs of projecting strips for binding cement to the framework, the projecting strips of said internal angle coupling hook plates having a respective smoothly curved end, two longitudinal reinforcing ribs at two opposite lateral sides of said elongated plates, and a plurality of hooks extending outwardly from two opposite lateral sides and adapted for engaging and fastening to said rectangular holes of said second side covers;

said external angle coupling hook plates are angled coupling hook plates adapted for fastening two built-up partition wall frameworks at right angles, each of said external angle coupling hook plates comprising two elongated plates formed angularly with each other, said elongated plates having reversed pairs of projecting strips for binding cement to the framework, the projecting strips of said external angle coupling hook plates having a respective smoothly curved end, two longitudinal reinforcing ribs at two opposite lateral sides of said elongated plates, and a plurality of hooks extending outwardly from two opposite lateral sides and adapted for engaging and fastening to said rectangular holes of the second side covers and being positioned externally of said internal angle coupling hook plate;

said wall to wall coupling hook plates are flat hook plates made of different widths and arranged in pair for fastening two built-up partition wall frameworks in a line, each of said wall to wall coupling hook plates comprising reversed pairs of projecting strips for binding cement, the projecting strips of said wall to wall coupling hook plates having a respective smoothly curved safety end, two longitudinal reinforcing ribs at two opposite lateral sides, and a plurality of hooks extending outwardly from two opposite lateral sides and adapted for fastening to the rectangular holes of said second side covers;

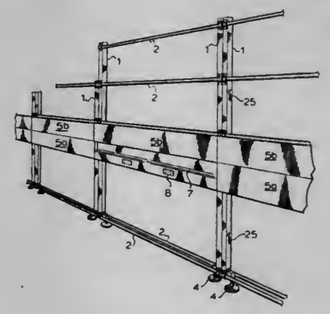
said filler plates are adapted to be mounted in parallel between said main wall panels and supported in vertical between each two main wall panel coupling hook plates.

5,813,178

MODULAR OFFICE FURNITURE PARTITION

John R. Edwards, Nobleton, Canada, assignor to Hollanding Inc., Newmarket, Canada

Continuation-in-part of Ser. No. 423,650, Apr. 17, 1995, and a continuation-in-part of Ser. No. 136,809, Oct. 15, 1993, Pat. No. 5,406,760. This application May 29, 1996, Ser. No. 655,001
Int. Cl.[6] E04B *5/48*
U.S. Cl. 52—239 **41 Claims**



1. An upright partition comprising:

a frame comprising at least two vertical internal frame members each having outward opposing faces defining spaced apart parallel forward and rearward planes, and further comprising a plurality of horizontal external frame members including at least two external frame members overlapping the at least two elongated internal frame members in each said plane, each external frame member having an inward face and an outward face, the inward face of each external frame member being connected to one of the outward faces of each of said internal frame members in an overlapping moment-resisting fixed connection;

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whereby an internal cavity is defined comprising:

(a) a central space between said forward and rearward planes bounded by said internal frame members, and (b) a plurality of raceways bounded by adjacent external frame members outward from said forward and rearward planes,

the central space and each raceway open to each other between the internal and external frame members permitting passage of utilities therebetween within the partition.

5,813,179

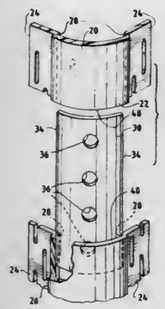
DRYWALL-TRIMMING ASSEMBLY EMPLOYING PERFORATED SPLICE

Joseph M. Koenig, Jr., Lincolnwood; Leopold Budzik, and Mark Budzik, both of Niles, all of Ill., assignors to Trim-Tex, Inc., Lincolnwood, Ill.

Continuation-in-part of Ser. No. 609,848, Mar. 1, 1996. This application Apr. 12, 1996, Ser. No. 631,781

Int. Cl.[6] E04B *2/00*

U.S. Cl. 52—255 **3 Claims**



1. A drywall corner-trimming assembly comprising two corner-trimming members approximating each other at one end of each member and comprising a splice, each member having a central portion with two lateral edges and two flanged portions extending respectively from the lateral edges of the central portion, the central portion having an interior surface and an exterior surface, the splice having two expansive surfaces two lateral edges and perforations spaced along the splice, wherein the central portion of each member has a generally arcuate profile, the interior surfaces being concave and the exterior surfaces being convex, wherein each flanged portion of each member extends from one of the lateral edges of the central portion of said member, wherein the members and the splice are assembled so that the splice straddles said members and so that a portion of a given one of the expansive surfaces faces the interior surface of the central portion of each of the members, which portion that faces the interior surface is located where the splice has at least one of the perforations, and wherein an adhesive layer is interposed between the same one of the expansive surfaces of the splice and the interior surfaces of the central portions of the members and is ventilated by the perforations, whereby the splice resists butt-edge separation of said members.

5,813,180

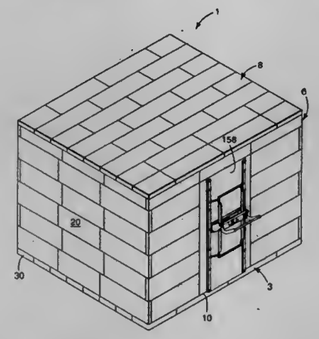
PRIVACY ENCLOSURE

Leland R. Whitney, St. Paul; Thomas J. Scanlan, Woodbury; Charles A. Marttila, Shoreview; Ronald W. Gerdes, St. Paul; David W. Schilling, Woodbury; Joseph G. Mandell, Maplewood, and Gary N. Harvieux, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1996, Ser. No. 623,619

Int. Cl.[6] E04B *1/80*

U.S. Cl. 52—270 **10 Claims**



1. An enclosure comprising a bottom portion having a bottom surface, at least one side wall, and a roof in which the bottom portion, at least one side wall, and roof are constructed of a plurality of adjacent panels under the following conditions:

a. each panel has two major surface which face inside and outside of the enclosure respectively, edge portions, and grooves in at least one edge portion, said panels being joined by mating members inserted into the grooves of adjacent panels, said mating members each being a single piece that is inserted into the grooves of adjacent panels;

b. each panel is comprised of a material which in an acoustic barrier;

c. there are at least two foil layers within and approximately congruent with one major surface of said panels, said fiber layers being separated from each other by part of the thickness dimension of the panel and arranged so that they at least partially cover the grooves of each panel;

d. they are at least two foil layers at least partially covering the sides of each mating member;

e. the foils of each panel and the mating members inserted into the grooves thereof are in sliding contact with each other; and

f. no fastens which penetrate the panels or mating members are required in the enclosure.

5,813,181

CONTINUITY TIE

Roger Wall Ashton, 170 Moraga Way, Orinda, Calif. 94553; Robert Donald Lucey, 1133 Palomares Ct., Lafayette, Calif. 94549, and John Duncan Pryor, 4028 39th Ave., Oakland, Calif. 94619

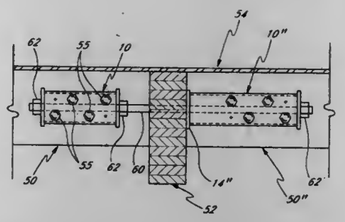
Filed Aug. 21, 1995, Ser. No. 517,299

Int. Cl.[6] E04H *1/98*

U.S. Cl. 52—291 **26 Claims**

1. A continuity tie for securing together in tension and compression resistive manner a pair of building structural members having surfaces, said continuity tie comprising:

a central tubular body member having front and back walls and opposing ends, said front and back walls having a plurality of aligned pairs of bolt mounting apertures formed therein and distributed in a predetermined pattern;



a pair of end plates each secured to a different one of said opposing ends, said end plates having a rod mounting aperture formed therein; and

a continuity tie member sized to simultaneously extend through both of the rod mounting apertures.

5,813,182

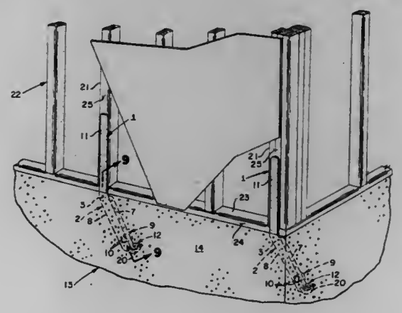
STRAP TIE CONNECTOR

Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., Pleasanton, Calif.

Filed Oct. 23, 1996, Ser. No. 740,020

Int. Cl.[6] E02D *27/00*

U.S. Cl. 52—295 **39 Claims**



1. A connector for securing a first structural member to a concrete second structural member, said connector comprising:

a. a foot section having a proximal portion, a distal portion, substantially planar lateral side portions and curled lateral side edges, said curled side edges being curled away from said planar lateral side portions along a substantial portion of the length of said foot section to aid said concrete of said second structural member to flow around said foot section;

b. an attachment section integrally connected to said proximal portion of said foot section; and

c. a hook section integrally connected to said distal portion of said foot section, said hook section adapted to provide mechanical interlock with said concrete of said second structural member.

5,813,183

METHOD OF COATING

Begona Attley, The Green, Horton-cum-Studley, Oxfordshire 0X9 1AY, Great Britain

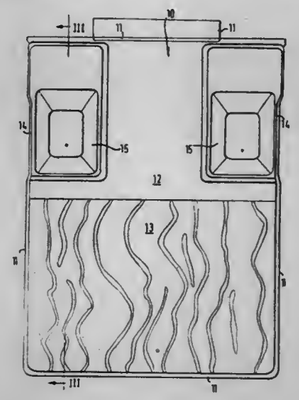
PCT No. PCT/GB95/01368, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO95/34384, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 12, 1995, Ser. No. 750,199

Claims priority, application United Kingdom, Jun. 14, 1994, 9411877; Oct. 18, 1994, 9421004; Nov. 2, 1994, 9422126

Int. Cl.[6] E04D *1/22*

U.S. Cl. 52—311.1 **10 Claims**



6. A sheet building component which is decorated to give the appearance of a mineral, stone, or ceramic material with at least a portion of a surface of said component having a varied surface pattern of raised and depressed portions and being coated by layers of polymeric material having particlate material embedded therein, said poylmeric material layers comprising a first layer of powder coated polymeric material having the particulate material scattered thereon, and a second layer of powder coated polymeric material coating both the first layer and the particulate material all said layers being of substantially uniform thickness on the raised and depressed portions.

5,813,184

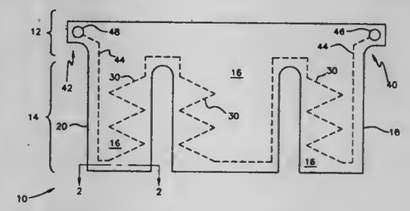
HEATED SERIALLY CONNECTABLE ROOFING SHINGLES

David J. McKenna, P.O. Box 8031, Breckenridge, Colo. 80424

Filed May 13, 1997, Ser. No. 855,450

Int. Cl.[6] E04D *1/22;1/28*

U.S. Cl. 52—518 **4 Claims**



1. A self-heating roofing surface construction element comprising:

a generally planar body having a right lateral edge, a left lateral edge, a top weather surface formed from a weather resistant

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material and a bottom structural contact surface located on the opposite side from said top weather surface;

an electrical heating element embedded within said generally planar body between said top weather surface and said bottom structural contact surface;

a first tab located proximate said right lateral edge and a second tab located proximate said left lateral edge, said tabs projecting from said generally planar body, each said tab having at least one electrical conductor connected to said heating element, each said electrical conductor having a male terminal end and a female terminal end located oppositely said male terminal end and where said male terminal end of said electrical conductor extends past said top weather surface and said female terminal end extends past said bottom structural contact surface; whereby

a plurality of said construction elements may be fitted in catenated fashion and a source of electrical power connected therewith.

5,813,185

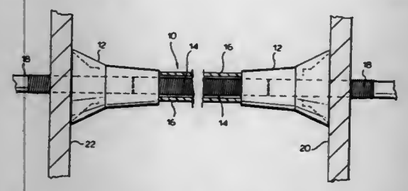
SPACER RECIEVER FOR A WALL FORM TIE ROD

George W. Jackson, Suit 1107-1535 Lake Shore Rd., Mississauga Ontario, Canada, L5EJE2

Filed Apr. 29, 1996, Ser. No. 639,574

Int. Cl.[6] E04B *1/02;* **E04C** *3/30*

U.S. Cl. 52—562 **12 Claims**



12. A wall form assembly for forming a mold for a wall of pourable, curable material, comprising:

a first wall form having a plurality of apertures therethrough;

a second wall from, opposed to said first wall form, having corresponding apertures therethrough;

tie rods, each having opposite threaded ends and fastener means for attaching said rods to said first wall form through said apertures in said first wall form;

nut spacers for attaching to an end of each said rod, said nut spacers each having a first section having a substantially conical, recessed guide surface for directing a probing rod extending through a corresponding aperture in said second opposed wall form towards an opening at an apex region of said guide surface, said guide surface presenting a guide opening larger than said apex opening, and a second section axially extending from the first section and having a threaded bore communicating with said apex opening for engaging said rod at an end of the threaded bore opposite the apex opening.

5,813,186

CONSTRUCTION BLOCKS WITH COMPLEMENTARY INTERSTITIAL MODULES

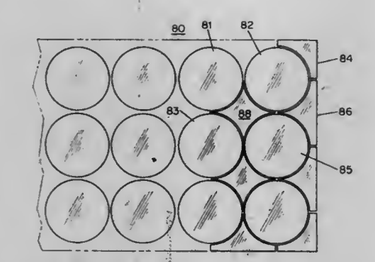
Ione Acksel, 1267 Carlls Straight Path, Dix Hills, N.Y. 11746

Filed Feb. 24, 1997, Ser. No. 804,944

Int. Cl.[6] G04B *5/04*

U.S. Cl. 52—604 **23 Claims**

1. A set of complementary block units, suitable for use in panel construction, comprising:



a cylindrical block unit formed of glass material with front and rear surfaces respectively having front and rear convex curved peripheral edges spaced apart by a cylindrical side surface and having one of a groove and a ridge extending at least partially around said side surface, said side surface suitable for receiving grout material; and

an interstitial block unit with front and rear surfaces having peripheral edges each including at least one concave curved edge portion dimensioned for complementary fit with a portion of said convex curved peripheral edges of said cylindrical block unit;

said interstitial block unit including, between said concave curved edge portions, an arcuate side surface having one of a ridge and a groove dimensioned for complementary fit with the side surface of said cylindrical block unit and suitable for receiving grout material.

5,813,187

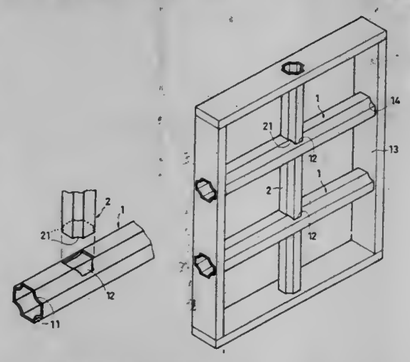
METAL BARRIER FOR A WINDOW OR DOOR FOR PROHIBITING BURGLARS FROM BREAKING IN

Ming-Kun Lee, 2/F., No. 13, Hsing-Nan St., Nan-Kang Dist. Taipei City, Taiwan

Filed Jun. 27, 1997, Ser. No. 884,651

Int. Cl.[6] E04C *2/42*

U.S. Cl. 52—664 **6 Claims**



1. A metal barrier comprising:

a metal frame formed by four rail members, each of said rail members having a plurality plug holes formed therein;

a plurality of transverse tubular metal members mounted within said metal frame and having respective ends thereof respectively fitted into said plug holes on opposing vertical sides of said metal frame, each of said plurality of transverse tubular metal members having a plurality of spaced holes formed therethrough; and,

a plurality of longitudinal tubular metal members intersecting said transverse tubular metal members and being mounted in said metal frame, each of said plurality of longitudinal tubular metal members being respectively inserted through a respective one of said plurality of holes in each of said plurality of transverse tubular metal members and having respective ends thereof respectively fitted into said plug holes on opposing horizontal sides of said metal frame.

5,813,188

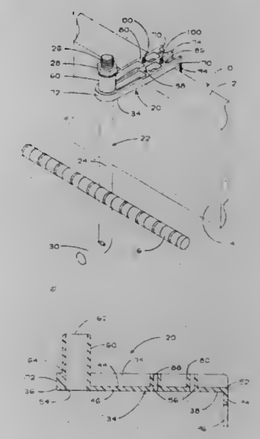
ACCESSORY FOR BUILDING CONSTRUCTION

Dean B. Behlen, Paso Robles, Calif., assignor to Diane E. Miller, Templeton, Calif.

Filed Jul. 18, 1997, Ser. No. 896,414

Int. Cl.[6] F04B *1/38*

U.S. Cl. 52—699 **22 Claims**



1. A holder usable in building construction for holding anchor bolts, rebar, and the like elements, in predetermined positions during the pouring of concrete therearound, comprising:

an elongated base plate having front and rear ends, opposite side edges, a top surface and a bottom surface, the front end of the base plate having an end hole therethrough;

a sleeve upstanding from the top surface of the base plate over the end hole for receiving such an element; and

elongated side ribs upstanding from the top surface of the base plate, extending lengthwise along and flush with the side edges, and connected to the sleeve.

5,813,189

Patent Not Issued For This Number

5,813,190

Patent Not Issued For This Number

5,813,191

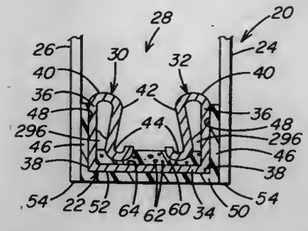
SPACER FRAME FOR AN INSULATING UNIT HAVING STRENGTHENED SIDEWALLS TO RESIST TORSIONAL TWIST

Raymond G. Gallagher, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 29, 1996, Ser. No. 705,481

Int. Cl.[6] A47G *1/00;* **E04C** *2/54*

U.S. Cl. 52—786.13 **34 Claims**



1. An elongated spacer stock used in the manufacture of a spacer frame to separate sheets of an insulating unit, the spacer stock comprising:

an elongated base;

a first elongated leg having a first member and a second member joined together to have a generally U-shaped cross section;

a second elongated leg having a first member and a second member joined together to have a generally U-shaped cross section; wherein

the first and second legs are spaced from and out of contact with one another and joined to the base to provide a generally U-shaped cross section with open end of the U formed by the first and second legs and base in a first direction, the U shape of the first leg open in a second direction, and the U-shape of second leg open in the second direction with the first and second directions opposite to one another, and the first and second legs spaced from and out of contact with one another.

5,813,192

BAG DISCHARGE DEVICE

Harold R. White, New Lenox, Ill., assignor to ABR Corporation, New Lenox, Ill.

Filed Apr. 29, 1996, Ser. No. 639,730

Int. Cl.[6] B65B *43/26*

U.S. Cl. 53—381.2 **9 Claims**

1. An apparatus for discharging contents of a bag, said apparatus comprising:

an enclosure having a horizontal opening, said enclosure having a cover hinged to a side of the opening and movable between an opened position and a position closing the opening, said enclosure having conveyor means for removing material received in the enclosure;

means for moving the cover between said positions;

a pair of pans mounted in the enclosure adjacent the opening for pivotable movement between a horizontal position with the pans aligned to receive a bag and a second position with the pans tilted toward a vertical position;

means for pivoting the pans between said positions;

a bag spike associated with each pan;

means for mounting said bag spike on the enclosure for movement from a first position with the spike impaling a bag on the pan to a retracted position withdrawn from said pan;

means for moving the spike between said position;

means for cutting a bag positioned on said pans; and

a bag flattener being mounted above each pan, each bag flattener including a weight and an actuator for lifting the weight to a retracted position and releasing the weight to fall onto a bag

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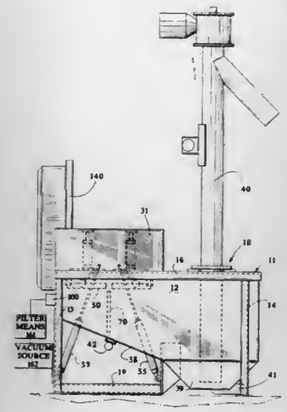


to aid in holding the bag during impaling and cutting and to flatten the empty bag after discharging the contents of the bag so that a bag placed on the pans can be impaled, cut and than emptied while completely enclosed in the enclosure.

5,813,193

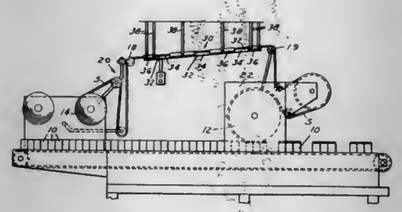
METHOD AND APPARATUS FOR APPLYING CARRIERS TO CONTAINERS

John Chan, DeSoto, Tex., and Richard L. Chaddock, Huntington Beach, Calif., assignors to Owens-Illinois Labels Inc., Toledo, Ohio

Filed Mar. 24, 1997, Ser. No. 823,674

Int. Cl.[6] B65B *27/04;61/14*

U.S. Cl. 53—398 **5 Claims**



1. Apparatus for applying plastic carriers to groups of containers which comprises:

means for supplying carriers in a continuous strip of plastic,

means for applying the carriers to groups of containers by elastically stretching each carrier until openings in the carrier are positioned over the containers and then releasing the carrier elastically to grip the containers, and

means positioned between said supplying means and applying means for heating the entirety of said strip as said strip passes through said heating means to said applying means so as to enhance elasticity of said strip without softening or plastic deformation of said strip.

5,813,194

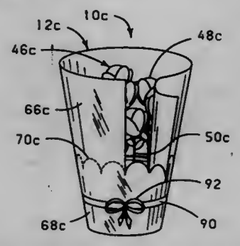
METHOD OF ATTACHING A SLEEVE TO A POT

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Continuation of Ser. No. 701,818, Aug. 23, 1996, Pat. No. 5,735,103, which is a continuation of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, which is a continuation-in-part of Ser. No. 1,001, Jan. 6, 1993, Pat. No. 5,307,606. This application Jun. 10, 1997, Ser. No. 872,772

Int. Cl.[6] B65B *25/02*

U.S. Cl. 53—399 **22 Claims**



1. A plant packaging method, comprising the steps of:

providing a pot having a shape and having an outer surface, an adhesive or cohesive bonding material disposed upon at least a portion of said outer surface, the pot containing a floral grouping;

providing a preformed flexible sleeve which is positionable about the pot and the sleeve having a conforming portion for closely surrounding and encompassing the pot;

disposing the pot within the preformed flexible sleeve, wherein the conforming portion of the preformed flexible sleeve is positioned adjacent the pot, and bondingly connecting the conforming portion of the sleeve to the pot via the adhesive or cohesive bonding material on the pot, wherein the conforming portion of the sleeve closely conforms to the shape of the pot; and

wherein the conforming portion is positioned about the pot and connected thereto such that the conforming portion of the sleeve remains disposed about the pot and substantially surrounds and encompasses the pot.

5,813,195

METHOD AND SYSTEM FOR BUILDING UP WEIGHED-OUT PORTIONS OF OBJECTS

Ulrich Carlin Nielsen, Ry; Søren Poulsen, Århus; Henrik Grundtvig, Brabrand, and Jesper Skovsgård, Skanderborg, all of Denmark, assignors to Scanvagt A/S, Arhus, Denmark

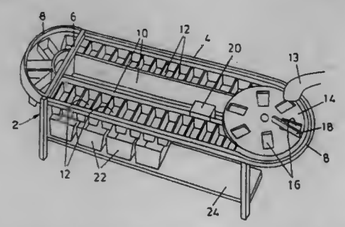
PCT No. PCT/DK94/00279, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO95/01909, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 6, 1994, Ser. No. 578,655

Claims priority, application Denmark, Jul. 6, 1993, 0805/93

Int. Cl.[6] B65B *01/32*

U.S. Cl. 53—443 **25 Claims**



1. A method of isolating from an unorderly flow of articles, including foodstuff articles of semi soft and sticky types, weight determined article groups based on a previous weighing of the articles, said method comprising providing an unorderly flow of articles, performing compulsory actions on the unorderly flow of articles to isolate successively advanced portions of said unorderly flow of article into entirely separated portions, moving said isolated portions through a weighing station to determine the weight of the respective portions, and merging selected portions to form said weight determined article groups, wherein said isolation of the portions is effected by such compulsory actions on the unorderly flow that the same will be safely separated into entirely separated portions which, regarding local spreading and mutual spacing, comply with operative requirements of said weighing station for well defined weighing of successive weighing units.

5,813,196

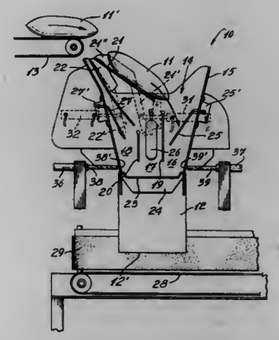
AUTOMATIC SEQUENTIAL BAGGING MACHINE WITH CONSTANT FEED AND METHOD OF OPERATION

Serge Pagé, Pointe-du-Lac; Guy Champagne, Boucherville; Dave Roberts, Bowmanville, and John Edwards, Montreal, all of Canada, assignors to Glopak, Inc., Montreal, Canada

Filed Jan. 16, 1996, Ser. No. 586,031

Int. Cl.[6] B65B *35/30*

U.S. Cl. 53—448 **16 Claims**



13. A method of automatically bagging at least two articles in a bag from an article receiving housing having at least two compartments loaded in alternating sequences from an article feeding device carrying a plurality of spaced articles, said method comprising the steps of:

i) feeding by means of a hinge gate a first one of said articles in a first compartment of an article holding housing,

ii) detecting said first article entering said first compartment,

iii) displacing a first hinge gate to a non-obstruction open position with respect to a further compartment to accept a second article in said further compartment,

iv) detecting said second article entering said further compartment,

v) discharging said articles from a bottom end of said compartment through a hinged gate to release the articles into said bag,

vi) actuating an article support means to enter said further compartment to obstruct an open bottom end of said further compartment a predetermined time delay after said step (v) to support a first article of a next group of articles being discharged in said further compartment while said hinged gate remains in said non-obstructing open position to accept said first article of said next group of said two articles.

5,813,197

PROCESS AND PLANT FOR PACKAGING FLUID OR SEMI-FLUID PRODUCTS IN THERMOFORMABLE SYNTHETIC RESIN CONTAINERS

Carlo Aguzzoli, Roggio Emilia, Italy, assignor to Unifull S.p.A., Italy

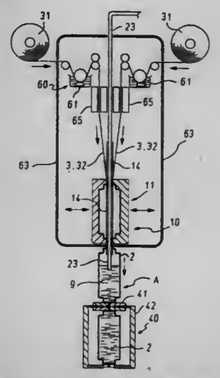
PCT No. PCT/IB94/00014, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO94/19240, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 16, 1994, Ser. No. 507,308

Claims priority, application Italy, Feb. 23, 1993, RE93 A 000017

Int. Cl.[6] B65B *47/00*

U.S. Cl. 53—453 **14 Claims**



1. Process for packaging fluid or semi-fluid products in thermoformable synthetic resin containers each defining an internal chamber, comprising providing around tubular means at least one continuous web of thermoformable synthetic resin, bringing together sections of a die to receive the at least one web between them and thereby to encircle said tubular means with said die having opposite entry and exit sides for said at least one web, and to seal together parts of said at least one web, which parts correspond to outlines of the containers, to define a desired external shape of the containers, forming a chamber in said at least one web by injection of pressurized fluid through said tubular means, filling the container with a product through said tubular means, and sealing the container, wherein said tubular means extends through both of said entry and said exit sides of said die throughout said process.

5,813,198

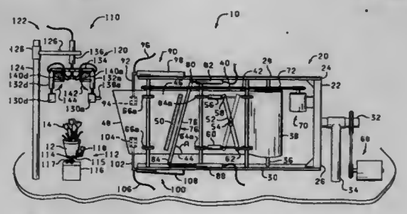
POT WRAPPING APPARATUS AND METHOD

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 402,687, Mar. 13, 1995, Pat. No. 5,647,193. This application May 8, 1997, Ser. No. 854,046

Int. Cl.[6] B65B *11/04;25/02*

U.S. Cl. 53—465 **16 Claims**



1. A method of wrapping a sheet of material about a potted plant, the potted plant having an outer peripheral surface and a bottom

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surface and the sheet having a leading edge, a lower edge and an upper edge, the method comprising the steps of:

disposing the potted plant upon a rotatable support means; and

rotating the rotatable support means and the potted plant and drawing the sheet of material about outer peripheral surface of the potted plant until the leading edge of the sheet engages another portion of the sheet of material and is bonded thereto via a bonding material thereby connecting the leading edge to the other portion of the sheet wherein the sheet of material circumferentially encompasses at least a portion of the outer peripheral surface of the pot.

5,813,199

METHOD AND APPARATUS FOR SEVERING FIBER BALE TIES

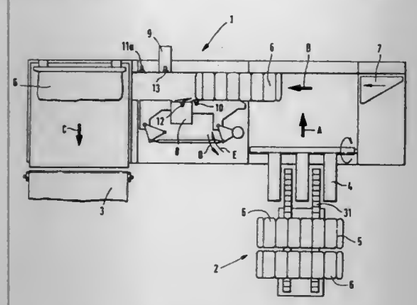
Josef Temburg, Jüchen, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Jun. 3, 1996, Ser. No. 660,008

Claims priority, application Germany, Jun. 2, 1995, 195 20 248.1

Int. Cl.[6] B65B *43/26*

U.S. Cl. 53—492 **15 Claims**



13. A method of severing a tie surrounding a fiber bale having a bottom face and two opposite side faces, comprising the following steps:

(a) advancing the fiber bale in a conveying direction along a travelling path on a supporting surface such that the bottom face of the bale is supported on the supporting surface and the side faces extend substantially perpendicularly to the supporting surface and parallel to the conveying direction;

(b) positioning an optical barrier at a predetermined position along said travelling path;

(c) causing the optical barrier to emit a signal upon passage of said bale at said predetermined position;

(d) moving a tie cutter transversely to said conveying direction from a remote position spaced from the bale toward and into engagement with one of the side faces of the bale;

(e) initiating said moving step when the bale has reached said predetermined position on said travelling path;

(f) holding said tie cutter stationarily;

(g) while performing steps (a) and (f), severing the bale tie by said tie cutter; and

(h) returning the tie cutter from said one side face of the bale towards said remote position.

5,813,200

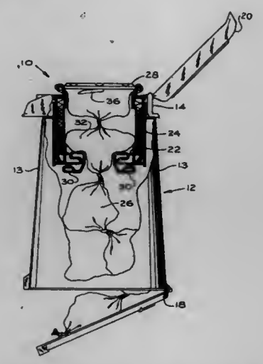
PACKAGING AND DISPOSAL SYSTEM

Charles J. Jacoby, Bentleyville; John R. Hickman, Tallmadge, and Michael J. Gallo, Twinsburg, all of Ohio, assignors to Mondial Industries, Ltd., Streetsboro, Ohio

Filed Dec. 17, 1996, Ser. No. 768,034

Int. Cl.[6] B65B *9/15;7/12;9/08*

U.S. Cl. 53—567 **11 Claims**



1. A device for packaging a series of packages of waste in a continuous length of flexible tubing, said device comprising:

a container having a removable cover at one end and an access door at the other end, said removable cover having an opening covered by a hinged lid;

a tubular core for storing a supply of flexible tubing;

a ring-shaped flange located inside said container upon which the tubular core rests;

a twist rim coupled to said tubular core and capable of twisting said flexible tubing;

a plurality of retention springs spaced around said container for holding the waste package stationary while said twist rim is twisting the flexible tubing; and

a latch mechanism for latching said hinged lid to said removable cover, said latch mechanism including a latch spring, a button coupled to said latch spring for operating said latch spring between a latching condition in which said latch spring latches said hinged lid to said removable cover and an unlatching condition in which said hinged lid is unlatched from said removable cover, and a lifting handle on said hinged lid to facilitate pivoting of said hinged lid relative to said removable cover to an open position when said latch spring is in its unlatching condition.

5,813,201

EQUESTRIAN BIT

Chang Hsi-Chang, Taichung, Taiwan, assignor to Eastwest International Enterprises, Taichung, Taiwan

Filed Apr. 15, 1997, Ser. No. 843,391

Claims priority, application China, Jul. 5, 1996, 96 2 16764.9; Jul. 5, 1996, 96 3 07256.0; Aug. 13, 1996, 96 3 07088.6; Aug. 14, 1996, 96 3 18141.6; Aug. 14, 1996, 96 3 18345.1; Aug. 14, 1996, 96 3 18346.X

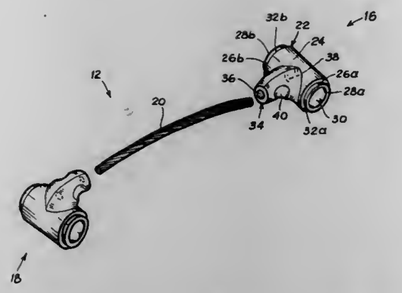
Int. Cl.[6] B68B *1/06*

U.S. Cl. 54—7 **21 Claims**

10. A bit comprising:

a first member including a first tubular portion for cooperating with a rein, said first tubular portion having opposed first ends;

a second member including a second tubular portion for cooperating with a rein, said second tubular portion having opposed second ends; and



a connecting member for connecting said first member and said second member to one another, each of said ends being provided with a shoulder consisting of a step in the tubular portion corresponding thereto.

5,813,202

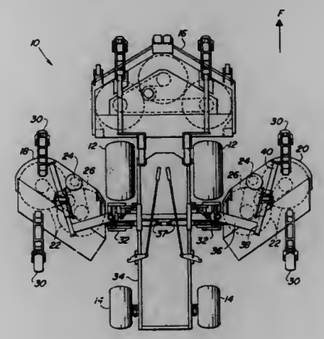
IMPACT ABSORBING MOWER DECK MOUNTING MECHANISM

Gerald Eugene Goman, Horicon, Wis., and Marlyn Lee Jerke, Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 13, 1996, Ser. No. 648,237

Int. Cl.[6] A01D *34/82*

U.S. Cl. 56—15.2 **32 Claims**



1. In combination, a mechanism which absorbs impacts encountered by a mower deck and coupled with a vehicle, comprising:

an arm operatively coupled with the vehicle,

a first member coupled with the arm and defining a generally linear axis, the first member and generally linear axis extend generally longitudinally with respect to forward direction of vehicle travel,

a second member operatively coupled with the mower deck and coupled with the first member for shifting the second member and mower deck linearly along said axis as the mower deck encounters frontal impact loads, and

a biaser operatively coupled between the first and second members for biasing the mower deck forwardly and for returning the second member and mower deck to their respective pre-impact positions.

5,813,203

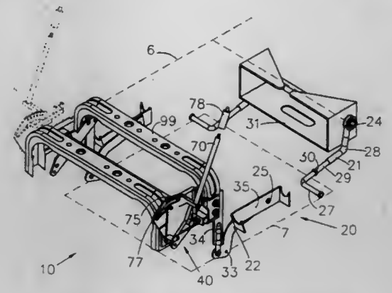
LOST MOTION LIFT CONTROL FOR A MOWER DECK

Tim Peter, Medina, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Jul. 12, 1996, Ser. No. 678,652

Int. Cl.[6] A01D *34/03*

U.S. Cl. 56—17.2 **26 Claims**



1. An improved lift control for an implement having a deck connected to a frame by at least one link, the improvement comprising a rotary shaft,

said rotary shaft being rotatively supported by the frame, a connector link, said connector link extending off of said rotary shaft,

said connector link having an end and a topside, said end of said connector link being connected to the link, a deck lift handle and lost motion interconnection means to interconnect said deck lift handle to said connector link said lost motion interconnection means directly contacting said topside of said connector link.

5,813,204

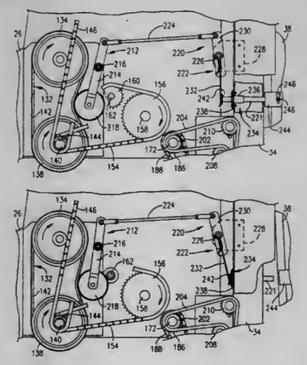
ROUND BALER HAVING TAILGATE-RESPONSIVE CLUTCH

Craig Pecenka, Newton, and Howard J. Ratzlaff, Hesston, both of Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Filed Oct. 18, 1996, Ser. No. 731,768

Int. Cl.[6] A01F *15/07*

U.S. Cl. 56—341 **31 Claims**



1. In a round baler having driveable bale forming components, a tailgate that is disposed in a closed position during bale formation, and drive mechanism including an endless drive belt which driv-

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ingly connects the bale forming components with a power source when under tension, the improvement comprising:

a pivotal idler arm having a rotatable idler sheave mounted thereto, the idler sheave being disposed for engagement with the drive belt for tensioning the drive belt as the idler arm pivots toward the drive belt; and

a swingable operating lever operably coupled with the idler arm to swing in a first direction when the idler arm pivots toward the drive belt and a second direction as the idler arm pivots away from the drive belt,

said lever being disposed for operable connection with the tailgate as the tailgate approaches its closed position to swing the lever in the first direction, whereby the idler arm pivots towards the drive belt and tensions the latter for drivingly connecting the bale forming components to the power source when the tailgate is in the closed position, and for disconnection from the tailgate as the tailgate moves out of the closed position allowing the lever to pivot in the second direction, whereby the idler arm pivots away from the drive belt for drivingly disconnecting the bale forming components from the power source.

5,813,205

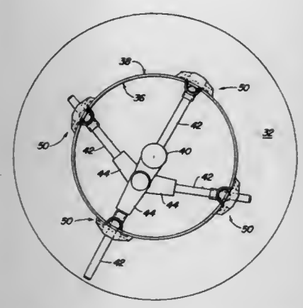
GUIDE ASSEMBLY FOR DISAPPEARING FINGERS

Duane Junior Gosa, Green Rock, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 13, 1997, Ser. No. 799,851

Int. Cl.[6] A01D *43/02*

U.S. Cl. 56—364 **15 Claims**



1. A harvesting platform for harvesting an agricultural crop, the platform comprising:

a supporting frame having an outlet;

a cutter being mounted to the supporting frame for cutting the agricultural crop;

an auger being rotatively mounted to the frame for concentrating the agricultural crop cut by the cutter, the auger is provided with a cylindrical tube and helical flighting being mounted to a first portion of the tube, a second portion of the tube is provided with apertures;

a plurality of disappearing fingers being mounted in the second portion of the tube, each of the disappearing fingers being provided with a tip for engaging the agricultural crop concentrated by the auger and propelling the agricultural crop through the outlet in the supporting structure;

each aperture of the second portion of the tube is provided with a guide assembly having an exterior surface, each guide assembly being provided with a sleeve for receiving a disappearing finger and functioning as a guide for the finger so that the tip can be completely recessed into the guide assembly inward from the exterior surface wherein the each sleeve being pivotally coupled to its respective guide assembly.

5,813,206

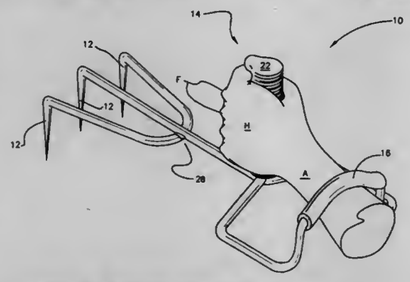
GARDEN TOOL HAVING ENHANCED LEVERAGE

Janie McKittrick, 4901 Frontenac Ave., Golden Valley, Minn. 55422

Filed Mar. 8, 1996, Ser. No. 614,158

Int. Cl.[6] A01D *7/00;* **A01B** *1/00*

U.S. Cl. 56—400.01 **4 Claims**



1. A hand held gardening implement, comprising

a frame member having a longitudinal dimension, a proximal end, and a distal end;

a working element attached to said frame member at said proximal end of said frame member;

a brace attached to said frame member at said distal end of said frame member; and

a handle attached to said frame member intermediate said working element and said brace, said handle projecting away from said frame member and generally transversely with respect to said longitudinal dimension of said frame member, said frame member comprising rod stock bent to form said working element, said brace, and said handle in sequential fashion from a unitary component.

5,813,207

CENTRIFUGAL SPINNING PROCESS AND DEVICE

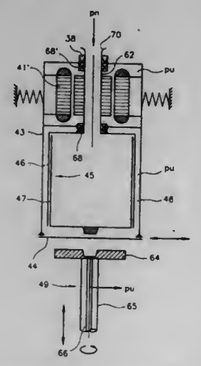
Reinhard König; Friedrich König, both of Mahlbergweg 5, 76275 Ettlingen, Germany, and Georg König, 250 Fitch St., New Haven, Conn. 06515

Filed Nov. 3, 1995, Ser. No. 552,634

Claims priority, application WIPO, May 4, 1993, PCT/EP93/01078

Int. Cl.[6] D01H *1/08;7/74*

U.S. Cl. 57—75 **29 Claims**



1. A centrifugal pot spinning process for spinning yarn comprising the steps:

placing a centrifuge (6, 35, 45, 53) in a container (7, 40, 48, 56);

reducing a pressure (pu) in the container to below atmospheric pressure;

maintaining standard ambient air pressure inside the centrifuge;

rotating the centrifuge (6, 35, 45, 53) in the container (7, 40, 48, 56) under reduced pressure (pu), while standard ambient air pressure (pn) prevails inside the centrifuge;

spinning yarn in the centrifuge under standard ambient air pressure (pn);

adjusting the reduced pressure (pu) in the container during rotation of the centrifuge in such a way that the air friction of the outer wall of the centrifuge (6, 35, 45, 53) is largely suppressed.

5,813,208

DEVICE FOR HOLDING AND RELEASING BOBBIN TUBES IN A POT SPINNING MACHINE

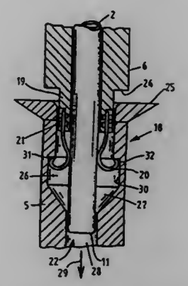
Karl Koltze, Mönchengladbach, Germany, assignor to W. Schlafhorst AG & Co., Moenchengladbach, Germany

Filed Oct. 11, 1996, Ser. No. 730,477

Claims priority, application Germany, Oct. 16, 1995, 195 38 411.3; Jul. 17, 1996, 196 28 717.0

Int. Cl.[6] D01H *1/08*

U.S. Cl. 57—76 **13 Claims**



1. A device for holding and releasing bobbin tubes on a pot spinning station having a yarn guide, said device comprising:

a bobbin tube holding body having a longitudinal axis, an interior passage along said axis, and a lower end;

said lower end having an outer surface and being adapted to fit within a bobbin tube;

said yarn guide being moveably mounted in said passage of said bobbin holding body for movement with respect to said bobbin holding body along a predetermined path aligned with said axis;

a plurality of gripping elements disposed at said lower end concentrically with respect to said axis, each of said gripping elements being moveable between an extended position extending radially outward of said outer surface of said lower end for gripping engagement of said bobbin tube, and a retracted position radially inward of said outer surface out of gripping engagement with said bobbin tube; and

said gripping elements being movable from each of said positions to the other said position in response to movement of said yarn guide along said path, whereby gripping of said bobbin tube by said gripping elements will be engaged and released by movement of said yarn guide.

5,813,209

PIECING METHOD AND DEVICE FOR A SPINNING MACHINE

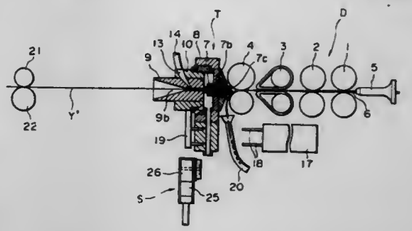
Osamu Hirao, Uji, and Masahiko Nishimura, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 14, 1997, Ser. No. 856,537

Claims priority, application Japan, May 16, 1996, 8-146632

Int. Cl.[6] D01H *11/00*

U.S. Cl. 57—261 **6 Claims**



1. A piecing method for piecing yarn to sliver in a spinning machine having a draft device for supplying sliver, a twist device including a spinning nozzle with a sliver guide entrance to receive sliver from said draft device and a spindle for twisting sliver into yarn, and a winding package for winding yarn produced by said twisting device, comprising the steps of:

withdrawing a predetermined length of yarn from said winding package for delivering it through said twist device to a holding region intermediate said twist device and said draft device;

blowing air through said spindle in the direction of said spinning nozzle to urge said yarn through said sliver guide entrance to said holding region between said twist device and said draft device;

supplying sliver by said draft device to said holding region for entangling with said yarn;

operating said twist device and said winding package to entangle said sliver with said yarn while pulling them through said sliver guide entrance of said spinning nozzle toward said winding package and thereby effect piecing of said sliver with said yarn.

5,813,210

TWISTING METHOD AND TWISTING FRAME UTILIZING I/F FLUCTUATIONS

Toshimitsu Musha, 13-17, Minami-Tsukushino 2-chome, Machida-shi, Tokyo; Yuichi Yanai, Okazaki; Kazuyoshi Muraoka, Osaka; Yuki Niwa, and Yasuo Nakano, both of Okazaki, all of Japan, assignors to Toshimitsu Musha, and Nisshinbo Industries Inc., both of Tokyo, Japan

Continuation of Ser. No. 396,227, Mar. 1, 1995, abandoned. This application May 9, 1997, Ser. No. 853,417

Int. Cl.[6] D01H *7/46*

U.S. Cl. 57—264 **8 Claims**

1. A twisting method comprising generating serial signals having a 1/f fluctuation, setting a twist count to correspond to the strengths of said serial signals having 1/f fluctuation, and applying twist to a

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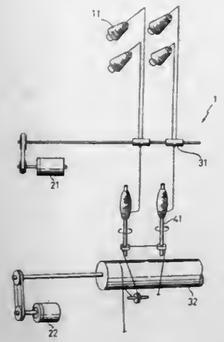


single yarn using said twist count producing a twisted single yarn having 1/f fluctuations therein to give a particularly comfortable feel to a subsequently produced product.

5,813,211

FEEDING AND OPENING DEVICE FOR AN OPEN-END SPINNING ARRANGEMENT

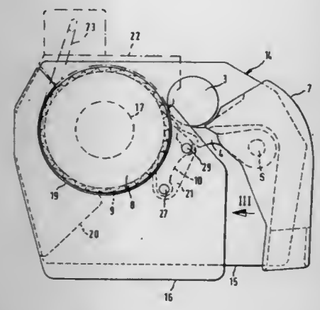
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 73337 Bad Überkingen, Germany, assignor to Fritz Stahlecker, Bad Überkingen, and Hans Stahlecker, Süssen, both of Germany

Filed Sep. 12, 1997, Ser. No. 928,629

Claims priority, application Germany, Sep. 24, 1996, 196 39 112.1

Int. Cl.[6] D01H *4/00*

U.S. Cl. 57—412 **14 Claims**



1. A feeding and opening device for an open-end spinning arrangement comprising:

a feed roller for feeding a sliver,

an opening roller rotating in an opening roller housing for opening the sliver to single fibers,

a feed table for pressing the sliver flexibly against the feed roller, and

a sliver support stationarily arranged between the feed table and the opening roller and applied detachably to the opening roller housing, which sliver support is provided with a deflecting edge for deflecting the sliver and with a supporting surface which presses the end of the sliver somewhat tangentially onto the opening roller,

wherein the opening roller housing comprises at least two housing parts, and

wherein the sliver support is exchangeably mounted on both housing parts.

5,813,212

NITROGEN OXIDE REMOVAL CONTROL APPARATUS

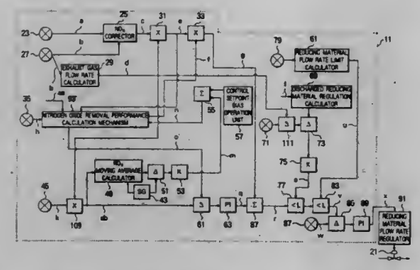
Haruo Oguchi; Shirou Hino, both of Yokohama, and Toshie Kataoka, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, and Toshiba Engineering Co., both of Kawasaki, Japan

Division of Ser. No. 712,271, Sep. 11, 1996, which is a division of Ser. No. 362,403, Dec. 23, 1994, Pat. No. 5,584,172. This application Sep. 22, 1997, Ser. No. 934,905

Claims priority, application Japan, Dec. 24, 1993, 5-325552

Int. Cl.[6] F02C *7/08*

U.S. Cl. 60—39.5 **6 Claims**



1. A nitrogen oxide removal control apparatus for controlling injection of a reducing material into an exhaust gas flow from a gas turbine unit, in a nitrogen oxide removal means, the apparatus comprising:

means for measuring a NOx amount at an outlet of the nitrogen oxide removal means to generate an outlet measured NOx signal;

means for calculating an injection flow rate of the reducing material based on a deviation of the outlet measured NOx signal and a NOx setpoint to approximate the deviation to zero and for generating a feedback control reducing material injection flow rate signal;

means for measuring a NOx amount at an inlet of the nitrogen oxide removal means to generate an inlet measured NOx signal;

means for calculating an amount of the reducing material effective to react with the NOx amount at the inlet of the nitrogen oxide removal means based on the inlet measured NOx signal and a predetermined mole ratio of a reducing material to NOx to generate an feedforward control reducing material injection flow rate signal;

means for calculating a reducing material injection flow rate into the exhaust gas flow based on the feedback control reducing material injection flow rate signal and the feedforward control reducing material injection flow rate signal; and

means for determining a state of a nitrogen oxide removal process based on a state amount of the nitrogen oxide removal means and for cutting off the feedback control reducing material injection flow rate signal into said means for calculating the reducing material injection flow rate when the state of the nitrogen oxide removal process is lower than a certain level.

5,813,213

Patent Not Issued For This Number

5,813,214

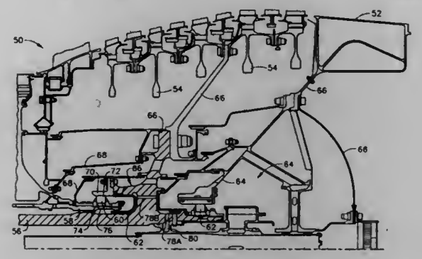
BEARING LUBRICATION CONFIGURATION IN A TURBINE ENGINE

Thomas Moniz, Loveland; Ambrose A. Hauser, Wyoming, and Jorge F. Seda, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 3, 1997, Ser. No. 778,597

Int. Cl.[6] F02C *7/06*

U.S. Cl. 60—39.08 **12 Claims**



1. A turbine engine comprising:

an outer case;

a high pressure system shaft;

at least one bearing supporting said high pressure system shaft;

a low pressure system shaft supported within said case, at least one lubrication opening in said low pressure system shaft, said lubrication opening having a center axis which is substantially normal to a plane along which an outer surface of said low pressure shaft extends; and

a plurality of seals for containing oil within a region occupied by said bearing.

5,813,215

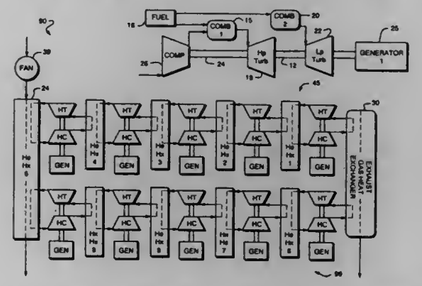
COMBINED CYCLE WASTE HEAT RECOVERY SYSTEM

Artbur M. Weisser, P.O. Box 194, Castine, Me. 04421

Filed Feb. 21, 1995, Ser. No. 392,374

Int. Cl.[6] F02C *6/00*

U.S. Cl. 60—39.181 **26 Claims**



1. A waste heat recovery system for generating electricity from hot exhaust fluid of a power plant open cycle primary stage, said waste heat recovery system and power plant open cycle primary stage forming a combined cycle power plant, said waste heat recovery system comprising:

a plurality of n secondary closed cycle circulating gas turbine stages coupled in series, each stage n comprising an nth closed circulating azeotropic gas loop filled with circulating gas having a high specific heat and a high thermal conductivity and an nth heat exchanger in the closed circulating gas loop, said nth heat exchanger being coupled between the (n−1)th closed circulating gas loop of the (n−1)th closed cycle circulating gas turbine stage and the nth closed circulating gas loop of the nth closed cycle circulating gas turbine stage for transferring heat to circulating gas in the nth closed circulating gas loop;

each closed cycle circulating gas turbine stage comprising an (n+1)th heat exchanger coupled between the nth closed circulating gas loop of the nth closed cycle circulating gas turbine stage and the (n+1)th closed circulating gas loop of the (n+1)th closed cycle circulating gas stage for transferring heat to circulating gas in the (n+1)th closed circulating gas loop;

each closed cycle circulating gas turbine stage n also comprising an nth turbine in the nth closed circulating gas loop downstream from the nth heat exchanger and upstream from the (n+1)th heat exchanger, a generator driven by the nth turbine, and a circulating gas compressor driven by the nth turbine, said circulating gas compressor being coupled in the nth closed circulating gas loop for pressurizing circulating gas in the nth heat exchanger for driving the nth turbine;

said n stages comprising a first closed cycle circulating gas turbine stage having a first closed circulating gas loop and a first heat exchanger coupled between the hot exhaust fluid of the power plant open cycle primary stage and the first closed circulating gas loop for transferring waste heat to circulating gas in the first closed circulating gas loop upstream from a first turbine;

and said n stages comprising a last closed cycle circulating gas turbine stage having a last closed circulating gas loop, and a last heat exchanger coupled in the last closed circulating gas loop downstream from a last turbine for transferring heat to a heat sink.

5,813,216

SOLID WRITING TOOL AND METHOD OF ERASING LINES DRAWN THEREWITH

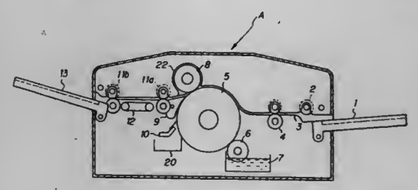
Masaaki Hoshiba, Fukioka, and Toshiyuki Kawanishi, Numazu, both of Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1995, Ser. No. 562,879

Claims priority, application Japan, Nov. 29, 1994, 6-294134

Int. Cl.[6] D06B *1/14*

U.S. Cl. 68—202 **5 Claims**



1. A solid writing tool for line drawing on an image holding-supporting member, wherein the image holding-supporting member comprises chartaceous layers containing cellulose fibers, wherein said writing tool comprises 50 to 90% of a thermoplastic resin for toner, 3 to 30 wt. % of a lubricant and at least one component selected from the group consisting of a filler, a pigment, and an additive selected from the group consisting of a plasticizer and a solvent, wherein the thermoplastic resin has a softening point falling within a range of −40° to +60° C. from a temperature of a peeling roller, and wherein lines which are drawn on the image holding-supporting member with the solid writing tool are removed when the member is dipped into a peeling liquid containing water and passed through a peeling roller, whereby said lines are erased by heat and pressure.

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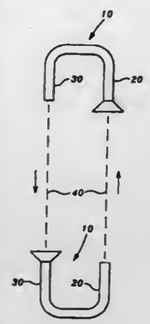
5,813,217

ION BEAM THRUST METHOD

James C. Beall, 8600 W. Old Ajo Way, Tucson, Ariz. 85735

Filed Apr. 5, 1996, Ser. No. 627,360
Int. Cl.[6] B64G *1/00*; H05H *1/00*
U.S. Cl. 60—202 4 Claims



1. An ion propulsion method for a first independent space borne PBA, and a second independent space borne PBA, the first and second PBA being on a common line of sight, the method comprising the steps of:

a) generating a first collimated, linear ion beam with the first PBA;

b) directing the first ion beam at the second PBA;

d) capturing the first ion beam with the second PBA;

e) generating a second ion beam at the second PBA;

f) directing the second ion beam at the first PBA;

g) capturing the second ion beam with the first PBA;

h) repeating steps (a) through (g) intermittently or continuously;

wherein the first and second ion beams move in parallel, spaced apart paths;

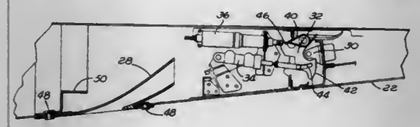
whereby momentum transfer between the first ion beam and the second PBA and the second ion beam and the first PBA is converted to thrust on the first and second PBA driving said first and second PBA apart or slowing the mutual approach of said first and second PBA.

5,813,218

THRUST REVERSER DOOR LOCK VENT AND METHOD

Leo Kohlbacher, Northbridge, Calif., assignor to Rooke Corp., North Hollywood, Calif.

Filed Nov. 26, 1996, Ser. No. 756,764
Int. Cl.[6] F02K *1/54*
U.S. Cl. 60—204 10 Claims



6. A method of reducing faulty operation of thrust reverser lock switches comprising:

disposing a duct through the outer skin of an engine nacelle so as to be in communication with the compartment containing a thrust reverser lock switch; and,

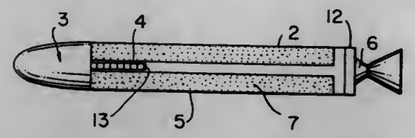
ducting through the duct, slipstream air having a sufficiently high energy to counteract the tendency of engine exhaust gas to flow back into the compartment and over the thrust reverser lock switch when the thrust reverser doors are extended.

5,813,219

ROCKET MOTOR PROTECTION DEVICE DURING SLOW COOK-OFF TEST

Moshe Gill, Haifa, and Itzhak Avnon, Shmuel, both of Israel, assignors to State of Israel - Ministry of Defence Armament Development Authority, Rafael, Haifa, Israel

Filed Jan. 10, 1995, Ser. No. 370,810
Claims priority, application Israel, Mar. 2, 1994, 108819
Int. Cl.[6] F02K *9/00*
U.S. Cl. 60—223 8 Claims



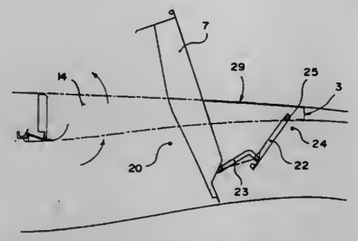
1. A device for imparting a non-explosive and a non-propulsive property to a rocket motor casing made from a composite material during a slow cook-off test, which consists of a pyrotechnic pellet having an ignition temperature of at least 140° C. but below the violent ignition temperature of the rocket propellant material under slow cook-off conditions, whereby the composite material of said casing loses its strength at said ignition temperature, said loss of strength causing a casing failure and a non-propulsive burning of the rocket propellant material.

5,813,220

JET ENGINE THRUST REVERSER HAVING A MOVABLE DOOR AND A MOVABLE PANEL PRESSURIZED TO THE CLOSED, FORWARD THRUST POSITION

Jean-Fabrice Marcel Portal, Sainte Adresse, and Guy B. Vauchel, Le Havre, both of France, assignors to Societe Hispano Suiza, Saint Cloud Cedex, France

Filed Feb. 21, 1996, Ser. No. 604,418
Claims priority, application France, Feb. 21, 1995, 95.01960
Int. Cl.[6] F02K *3/02*
U.S. Cl. 60—226.2 7 Claims



1. A thrust reverser for a turbojet engine having a cowling with an axial length and bounding a flow duct for a pressurized gas through which the pressurized gas flows in an upstream to downstream direction, the thrust reverser comprising:

a) at least one reverse thrust opening formed in the cowling;

b) at least one thrust reverser door pivotally attached to the cowling so as to pivot about a first pivot axis between a forward thrust position wherein the at least one thrust reverser door closes the at least one reverse thrust opening and forms a portion of the boundary for the flow duct, and a reverse thrust position wherein the at least one thrust reverser door opens the at least one reverse thrust opening and blocks a portion of the flow duct so as to direct the pressurized gas through the at least one reverse thrust opening;

c) a panel located downstream of the at least one thrust reverser door, and pivotally attached to the cowling; and,

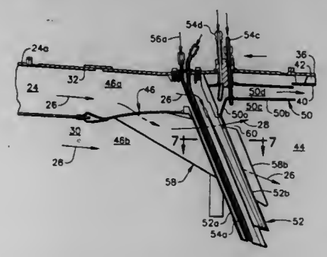
d) a linkrod connected to a front, upstream portion of the panel and to a rear, downstream portion of the at least one thrust reverser door whereby the panel pivots relative to the cowling about a second pivot axis located downstream of the connection of the linkrod to the panel, the at least one thrust reverser door and the panel pivoting in opposite directions about the first and second pivot axes when the at least one thrust reverser door moves between the forward and reverse thrust positions, such that, when the at least one thrust reverser door is in the forward thrust position, the panel forms a portion of the boundary for the flow duct whereby the pressurized gas acting on the at least one thrust reverser door and the panel urges the at least one thrust reverser door to the forward thrust position.

5,813,221

AUGMENTER WITH INTEGRATED FUELING AND COOLING

Frank A. Geiser; Timothy J. Freking, both of Cincinnati, and Ivan E. Woltmann, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 14, 1997, Ser. No. 783,519
Int. Cl.[6] F02K *3/08*
U.S. Cl. 60—261 10 Claims



1. An augmenter for a turbofan gas turbine engine having a core outlet for discharging core gases and a coannular bypass duct outlet for discharging bypass fan air, comprising:

an annular exhaust casing;

an annular combustion liner spaced radially inwardly from said exhaust casing to define therebetween a cooling duct for receiving said bypass air, said liner also defining radially inwardly therefrom a combustion zone;

an annular diffusion liner axially adjoining said combustion liner inside said casing, and defining with said casing an annular outer inlet for receiving from said bypass duct outlet said bypass air, and an annular inner inlet for receiving said core gases from said core outlet;

a ring flameholder including an aft facing radial wall adjoining said diffusion liner, and an integral axial wall adjoining said combustion liner;

a plurality of circumferentially spaced apart radial flameholders extending radially inwardly from said casing and through said diffusion liner forward of said ring flameholder, and each including a first fuel spraybar for injecting fuel in said core gases flowable into said combustion zone; and

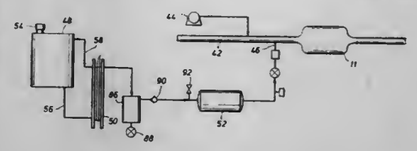
a mixer defined by a plurality of tubular injector chutes extending radially inwardly through said diffusion liner, and circumferentially spaced apart between respective pairs of said radial flameholders, with each chute having an inlet coextensive with said diffusion liner for receiving said bypass air, and an outlet at an opposite end for injecting said bypass air into said core gases for mixing in said combustion zone.

5,813,222

METHOD AND APPARATUS FOR HEATING A CATALYTIC CONVERTER TO REDUCE EMISSIONS

Anthony John Appleby, 2810 Briar Creek Crt., Bryan, Tex. 77802

Filed Oct. 7, 1994, Ser. No. 320,171
Int. Cl.[6] F01N *3/20*
U.S. Cl. 60—274 62 Claims



1. A method of heating a catalyst from a cold condition to light-off temperature for carbon-containing compounds, the method comprising the steps of introducing gaseous hydrogen and oxygen to the catalyst to induce spontaneous exothermic combination of the hydrogen and the oxygen by the catalyst prior to the introduction of reactive organic gases or carbon monoxide to the catalyst.

5,813,223

PROCESS FOR THE FILTRATION AND COMBUSTION OF CARBONACEOUS MATTER EMERGING FROM INTERNAL COMBUSTION ENGINES

Philippe Barthe, Saint Martin du Terre; Jacques Lemaire, Osny, and Dennis Petta, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

PCT No. PCT/FR94/01560, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO95/18198, PCT Pub. Date Jul. 6, 1995
PCT Filed Dec. 30, 1994, Ser. No. 505,251
Claims priority, application France, Dec. 31, 1993, 93 15985; Apr. 20, 1994, 94 04713; May 25, 1994, 94 06310; May 25, 1994, 94 06311
Int. Cl.[6] F01N *3/20*
U.S. Cl. 60—274 25 Claims

1. Process for the treatment of soot produced by an internal combustion engine, containing one or more rare-earth metals wherein said process comprises:

introducing into a combustion chamber of said combustion engine at least one derivative of a rare-earth metal or of a mixture of rare-earth metals at a concentration of between 10 ppm and 500 ppm, by mass;

collecting soot produced by the internal combustion engine on a filter;

contacting said soot with a gas containing oxygen, wherein said gas has a temperature of between 100° C. and 350° C. and the oxygen partial pressure of said gas containing oxygen is at least equal to 0.03 atmospheres; and

allowing the soot to accumulate until a speed is reached where a significant fraction of the soot arriving is compensated for by the combustion of soot in the soot cake on the filter and providing for no regeneration as long as the pressure drop caused by the soot does not exceed a predetermined value not exceeding 0.5 bar.

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5,813,224

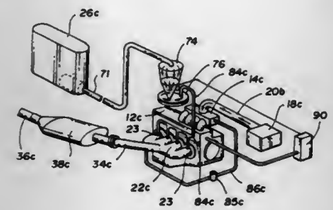
METHOD AND APPARATUS FOR REDUCING NO_x IN THE EXHAUST STREAMS OF INTERNAL COMBUSTION ENGINES

Vemulapalli Durga Nageswar Rao, Bloomfield Township, and Harry Arthur Cikanek, Northville, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Division of Ser. No. 411,911, Mar. 27, 1995, Pat. No. 5,584,265, which is a continuation of Ser. No. 86,400, Jul. 6, 1993, abandoned. This application Oct. 23, 1996, Ser. No. 740,032

Int. Cl.[6] F01N *3/00*

U.S. Cl. 60—274 6 Claims



1. An apparatus for reducing the concentration on NO_x in an exhaust stream of an internal combustion engine, comprising:

a piston-cylinder assembly having a lean air/fuel mixture contained therein;

a device for storing a selective reducing agent selected from the group consisting of; hydrazine; cyanuric acid per se; cyanuric acid in which one or more hydroxyl groups are substituted by $—NH_2$, —NHR, or $—NR_2$ wherein R is a C_{1-4} alkyl group; isocyanuric acid, and mixtures thereof; and

a device for introducing the reducing agent into said exhaust gases by introducing said selective reducing agent into said exhaust gases following their exit from the piston-cylinder assembly, the reducing agent decomposes to react with one or more products of combustion to produce an oxygen rich engine exhaust stream having a reduced concentration of NO_x, the amount of selective reducing agent introduced by said introducing device being about 50% or less of the stoichiometric amount of selective reducing agent based on the amount of NO_x generated in the absence of said selective reducing agent, and wherein the amount of selective reducing agent added varies with engine load.

4. A method for reducing the NO_x emissions from the exhaust stream exiting from an internal combustion engine wherein fuel is combusted in a combustion chamber, and wherein exhaust gases exiting said combustion chamber pass through an NO_x-reducing catalytic converter prior to exiting as an exhaust stream, said method comprising:

establishing a desired level of NO_x emissions in said exhaust stream, said desired level corresponding to an acceptable NO_x emissions level at an engine operating condition below full load; and

introducing into said combustion chamber during peak emissions when said NO_x emissions exceed said desired level of NO_x emissions, a selective reducing agent selected from the group consisting of ammonia; hydrazine; cyanuric acid per se; cyanuric acid in which one or more hydroxyl groups are substituted by $—NH_2$, —NHR, or $—NR_2$ wherein R is a C_{1-4} alkyl group; isocyanuric acid, and mixtures thereof;

said selective reducing agent present in an amount of less than about 50% of stoichiometry based on the amount of NO_x in said exhaust stream in the absence of said selective reducing agent.

5,813,225

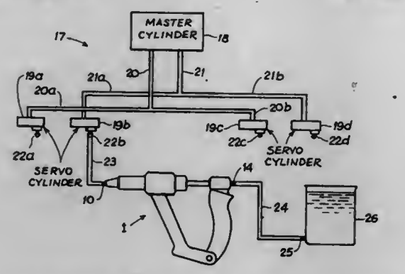
ARRANGEMENT AND METHOD FOR REMOVAL OF AIR FROM A HYDRAULIC SYSTEM

Jon A. Petty, Glendale, Ariz., assignor to Phoenix Systems, L.L.C., Tucson, Ariz.

Continuation-in-part of Ser. No. 441,187, May 15, 1995, Pat. No. 5,712,625. This application Oct. 29, 1996, Ser. No. 738,776

Int. Cl.[6] F16D *31/00*

U.S. Cl. 60—327 26 Claims



1. An arrangement for removing contaminants from a hydraulic system comprising:

a portable fluid conveying device for introducing fluid into or evacuating fluid from the hydraulic system, said device having an inlet and an outlet;

a first conduit connectible with said inlet;

a second conduit connectible with said outlet; and

a portable container for fluid introduced into or discharged from the hydraulic system, said container having a first opening for fluid and a second opening for fluid, said first conduit being connectible with one of said openings and said second conduit being connectible with the other of said openings to permit priming of said device with fluid from said container while bypassing the hydraulic system.

5,813,226

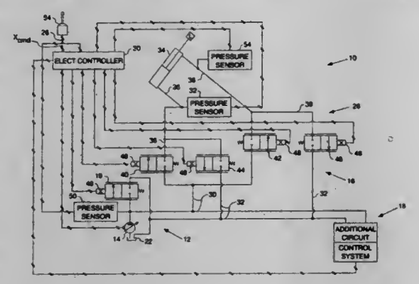
CONTROL SCHEME FOR PRESSURE RELIEF

John J. Krone, Dunlap, and Yaoxin Qian, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 15, 1997, Ser. No. 929,896

Int. Cl.[6] F16D *31/00*

U.S. Cl. 60—327 12 Claims



1. A method for controlling the pressure level of pressurized fluid in a hydraulic system having a source of pressurized fluid, a fluid actuator, an electrically actuated control valve mechanism disclosed between the source of pressurized fluid and the fluid actuator, an input controller connected to the electrically actuated control valve mechanism and operative to generate an electrical signal representative of the desired input, an electronic controller operative to receive the signal from the input controller and direct an output signal therefrom to the electrically actuated control valve mechanism, and a reservoir, the method comprises the following steps:

sensing the pressure level of the fluid at a predetermined location in the hydraulic system;

establishing a predicted pressure level based on at least the relationship of a pressure predict filter function, the sensed pressure level, the length of time of each sample step, the number of steps;

comparing the predicted pressure level to a predetermined pressure level that is representative of the pressure level needed to move the electrically actuated control valve mechanism to a position that is ready to initiate communication of the pressurized fluid with the reservoir;

comparing an input command signal with a command signal needed to initiate movement of the electrically actuated control valve mechanism to the position that it is ready to initiate communication of the pressurized fluid with the reservoir;

directing the input command signal to the electrically actuated control valve mechanism for movement thereof if the input command signal is greater than the command signal needed to initiate opening of the electrically actuated control valve mechanism;

comparing the predicted pressure level to a predetermined percentage of the predetermined pressure level necessary to move the electrically actuated control valve mechanism to a position that is ready to initiate communication of the pressurized fluid to the reservoir; and

moving the electrically actuated control valve mechanism to a position that is representative of the result of the step of comparing the predicted pressure level to a predetermined percentage of the predetermined pressure level necessary to move the electrically actuated control valve mechanism to a position that is ready to initiate communication of the pressurized fluid to the reservoir.

5,813,227

HYDROKINETIC TORQUE CONVERTER WITH STABILIZER RING ON THE BLADE WHEELS

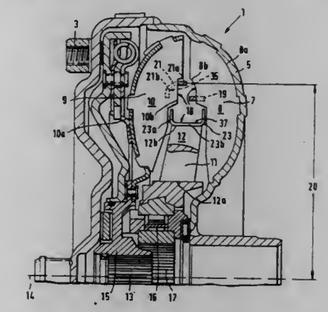
Uwe Dehrmann, Würzburg; Wilfried Glock, Dittelbrunn; Rüdiger Hinkel, Röthlein-Heidenfeld; Ruthard Schneider, Bad Königshofen; Peter Volland, Rannungen; Reinhold Weckesser, Sennfeld, and Hans-Wilhelm Wienholt, Schweinfurt, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Oct. 25, 1996, Ser. No. 738,229

Claims priority, application Germany, Oct. 26, 1995, 195 39 814.4

Int. Cl.[6] F16D *33/00*

U.S. Cl. 60—367 20 Claims



1. A hydrokinetic torque converter without an inside torus, comprising:

a pump wheel;

said pump wheel comprising a wall structure for directing fluid;

a turbine wheel;

said turbine wheel comprising a wall structure for directing fluid;

said hydrokinetic torque converter being disposed about a drive shaft of a motor vehicle, said shaft defining a longitudinal axis;

a fluid for transmitting torque between said pump wheel and said turbine wheel;

a stator to redirect flow of fluid within said hydrokinetic torque converter from said pump wheel to said turbine wheel;

said stator comprising a free-wheel mechanism to allow said stator to rotate with respect to at least one of said pump wheel and said turbine wheel and to allow said stator to remain stationary with respect to said at least one of said pump wheel and said turbine wheel;

said stator comprising a wall structure;

said pump wheel, said turbine wheel and said stator comprising wheels having blades for directing fluid;

said blades of said blade wheels comprising a first side and a second side, said second side extending from an outer periphery of the blade to an inner periphery of the blade;

said second side of said blades of said pump wheel each comprising a peripheral section;

said second side of said blades of said turbine wheel each comprising a peripheral section, said peripheral sections of said turbine wheel blades and said peripheral sections of said pump wheel blades being disposed substantially adjacent one another;

said second side of said blades of said pump wheel each comprising an interior section, said interior sections of said pump wheel blades each being disposed adjacent said stator;

said second side of said blades of said turbine wheel each comprising an interior section, said interior sections of said turbine wheel blades each being disposed adjacent said stator;

said interior sections being disposed adjacent the longitudinal axis;

said second side of each of said blades of said pump wheel comprising a center section disposed between said interior section and said peripheral section;

said second side of each of said blades of said turbine wheel comprising a center section disposed between said interior section and said peripheral section;

said peripheral sections of said blades being disposed further away from the longitudinal axis than said interior sections and said center sections of said blades;

said housing having a peripheral section;

said peripheral section of said housing being the portion of said housing being disposed furthest away from the longitudinal axis;

said peripheral sections of said blades being disposed adjacent said peripheral section of said housing;

each of said peripheral section, said interior section and said center section of each of said blades of said pump wheel and said turbine wheel comprising a substantial portion of said second side of each of said blades;

said blades of at least one of said blade wheels having its corresponding wall structure disposed along said first side of its corresponding blades;

said at least one of said blade wheels comprising at least one ring structure to stabilize the blades of said at least one of said blade wheels;

said at least one stabilizer ring being disposed to connect the individual blades of its corresponding blade wheel along said center section of said second side of its corresponding blades; and

said at least one stabilizer ring being disposed and configured to permit a substantial portion of said center section of said second side of said blades of its corresponding blade wheel to be unsupported by said at least one stabilizer ring.

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5,813,228

CARRIER VEHICLE EQUIPPED WITH A SWING TABLE

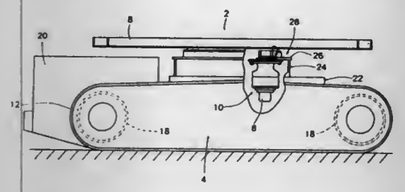
Yorimichi Kubota; Katsuo Nagao, both of Tokyo; Yoshio Hamada, Kobe; Kazuo Takahashi, and Masanori Hayashi, both of Hyogo-ken, all of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Mar. 26, 1996, Ser. No. 622,661

Claims priority, application Japan, Mar. 29, 1995, 7-070301; Aug. 24, 1995, 7-215542

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—454 **4 Claims**



1. A carrier vehicle comprising an under carriage, a swing table supported on said undercarriage to swing over a full turn, a drive motor, and a planetary reduction gear for reducing the revolution of said drive motor and transmitting it to said swing table, wherein said planetary reduction gear is mounted on said under-carriage under said swing table;

wherein said drive motor is constituted by a hydraulic motor;

said planetary reduction gear includes an input shaft driven by said hydraulic motor, an output shaft, and a planetary reduction gear means interposes between said input shaft and said output, and is mounted on said under-carriage in a manner that said output shaft is positioned on the upper side;

a pinion gear is attached to an upper end of said output shaft, a ring gear is secured on the lower side of said swing table, and said pinion gear is in mesh with said ring gear;

said hydraulic motor is driven as operation fluid in anoperation fluid tank is fed thereto by a hydraulic pump, and is equipped with a case that contains therein an operation fluid drain chamber;

said planetary reduction gear has a housing that includes an upper end wall and a lower end wall, said case of hydraulic motor is fitted to the lower surface side of said lower end wall, said case of said hydraulic motor is fitted to the lower surface side of said lower end wall, and said input shaft is so positioned as to penetrate through said lower end wall;

said output shaft is supported at an upper portion in said housing via a bearing means so as to rotate and is so positioned as to penetrate through said upper end wall, said pinion gear is disposed above said upper end wall, and an oil seal is interposed between said output shaft and said upper end wall;

said input shaft is supported by said lower end wall via a bearing means so as to rotate;

the drain chamber in said case of said hydraulic motor is communicated with the interior of said housing via a fluid passage means; and

the upper end of said housing is communicated with said operation fluid tank via a return fluid passage that includes an oil filter.

5,813,229

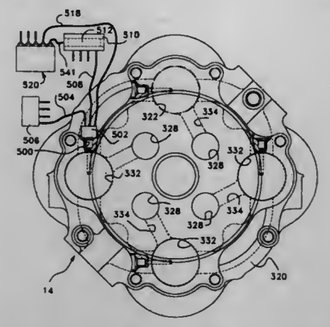
PRESSURE RELIEF SYSTEM FOR STIRLING ENGINE

Randall Robert Gaiser, 1569 Oakfield Dr., Ann Arbor, Mich. 48108

Filed Oct. 2, 1996, Ser. No. 725,120

Int. Cl.[6] F01B *29/10*

U.S. Cl. 60—525 **18 Claims**



1. A pressure relief system for a multi-cylinder heat engine, such as a multi-cylinder Stirling engine, having at least two essentially discrete working gas volumes which experience out of phase cyclical variations in pressure during operation of said engine, for equalizing the mean pressure within said working gas volumes and unloading said engine to reduce the likelihood of damage to the components of said engine in the event of severe pressure imbalance conditions within said engine, said pressure relief system comprising:

housing means for defining a cavity,

a spool positioned within said housing means cavity,

said spool moveable between closed and open positions within said housing means cavity,

wherein said spool and said housing means cavity cooperate in said closed position to form a plurality of isolated cavities, pressure in said isolated cavities acting to urge said spool to move toward said closed position, said spool and said housing means cavity further cooperating to define a buffer cavity, pressure in said buffer cavity acting to urge said spool to move toward said open position, and wherein when said spool is in said open position, said isolated cavities are vented together.

first conduit means for connecting said working gas volumes to said buffer cavity, said first conduit means providing a resistance to working gas flow such that the mean pressures in each of said working gas volumes equalizes though working gas flow between said working gas volumes and said buffer cavity is charged to the equalized mean pressures of said working gas volumes,

second conduit means for connecting each of said working gas volumes with one of said isolated cavities formed by said housing means cavity and said spool when said spool is in said closed position, and

whereby when the forces acting on said spool urging said spool to move toward said dosed position exceed the forces acting on said spool urging said spool to move toward said open position, said spool remains in said closed position and said engine operates normally, and when said forces acting on said spool urging said spool to move toward said open position exceed said forces acting on said spool urging said spool to move toward said closed position, said spool moves to said open position, thereby venting together said isolated cavities, allowing said working gas volumes to communicate and unloading said engine.

5,813,230

BRAKE LINKAGE AND MASTER BRAKE CYLINDER

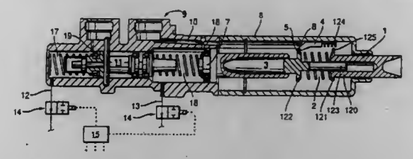
Matthias Hartl, Kernen; Harry Tröster, Tamm; Rainer Freitag, Nürtingen, and Martina Richerzhagen, Clausthal-Zellerfeld, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Nov. 21, 1996, Ser. No. 754,649

Claims priority, application Germany, Nov. 23, 1995, 195 43 698.9

Int. Cl.[6] F15B *7/00;* **B60T** *7/02*

U.S. Cl. 60—591 **39 Claims**



1. Brake linkage operably connectable between a brake pedal and a piston of a master brake cylinder, a brake pressure being generated by a movement of the piston in the master brake cylinder in at least one working chamber,

wherein the brake linkage comprises two rods which are designed to be relatively movable with respect to one another within a given play of movement, and wherein a switchable blocking device is arranged for blocking the relative movement between the two rods in response to relative movement of the two rods beyond said given play of movement.

5,813,231

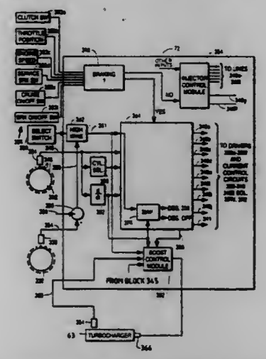
ENGINE COMPRESSION BRAKING APPARATUS UTILIZING A VARIABLE GEOMETRY TURBOCHARGER

James J. Faletti, Spring Valley; Dennis D. Feucht, and Scott G. Sinn, both of Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 468,937, Jun. 6, 1995, Pat. No. 5,540,201, which is a continuation of Ser. No. 282,573, Jul. 29, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 573,162

Int. Cl.[6] F02B *37/12;* **F02D** *13/04*

U.S. Cl. 60—602 **21 Claims**



1. A brake control for an engine having a variable geometry turbocharger which is controllable to vary intake manifold pressure and wherein the engine is operable in a powering mode for driving a load and a braking mode during which an engine exhaust valve is opened to allow compressed gases in an associated combustion chamber to escape during a compression stroke and thereby brake the load, comprising:

a turbocharger geometry actuator for varying turbocharger geometry;

an exhaust valve actuator for opening the exhaust valve; and

means operable while the engine is in the braking mode and responsive to a command representing a desired condition for operating the turbocharger geometry actuator and the exhaust valve actuator to vary the timing and duration of the opening of the exhaust valve and thereby permit selection of an adjustable braking magnitude.

5,813,232

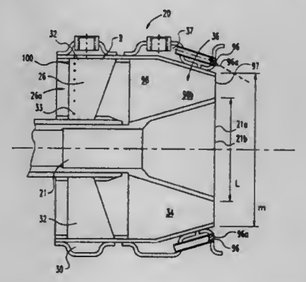
DRY LOW EMISSION COMBUSTOR FOR GAS TURBINE ENGINES

Mohan K. Razdan, Indianapolis; Jacob T. McLeroy, Franklin, and Duane A. Smith, Carmel, all of Ind., assignors to Allison Engine Company, Inc., Indianapolis, Ind.

Filed Jun. 5, 1995, Ser. No. 462,511

Int. Cl.[6] F02C *1/00*

U.S. Cl. 60—737 **17 Claims**



1. A combustor assembly for receiving a flow of fuel from an external source and a flow of air from a compressor, comprising:

a combustion housing having an upstream end and a downstream end; and

a premix dome connected to the upstream end of said combustion housing for receiving and substantially premixing the fuel and air prior to delivery to said upstream end of said combustion housing, said premix dome comprising:

a centerbody extending longitudinally through said premix dome;

a vaned swirler having an inlet and an outlet, said vaned swirler positioned around said centerbody and turning the flow of fuel and air from said inlet to said outlet through an angle between about 60° and about 70°; and

a fueling pathway for delivering fuel across said swirler.

5,813,233

THERMOELECTRIC COOLING DEVICE AND SYSTEM THEREOF

Hideaki Okuda, Nara, and Akira Takushima, Yamatotakada, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1995, Ser. No. 567,496

Claims priority, application Japan, Dec. 28, 1994, 6-328774

Int. Cl.[6] F25B *21/02;* **G02F** *1/13*

U.S. Cl. 62—3.7 **15 Claims**

1. A thermoelectric cooling device for cooling by the Peltier effect, comprising:

a thermoelectric module made of a Peltier element;

a heat-absorber heat-conductively joined to a cold-side portion of said thermoelectric module;

a radiator heat-conductively joined to a hot-side portion of said thermoelectric module; and

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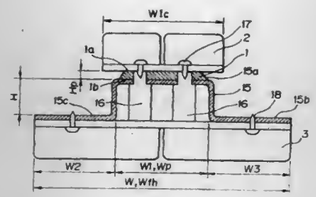


a module base, formed of a material having a high thermal-conductance, having a rectangular-projected portion and a flat portion,

the cold-side portion or the hot-side portion of said thermoelectric module being in contact with the rectangular-projected portion of said module base such that when the cold-side portion is in contact with said module base, said heat-absorber contacts the flat portion of said module base and when the hot-side portion is in contact with said module base, said radiator contacts the flat portion of said module base.

5,813,234

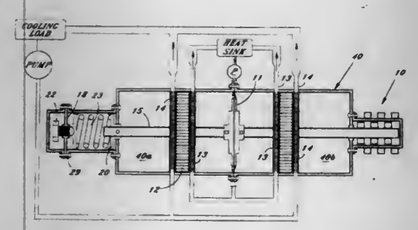
DOUBLE ACTING PULSE TUBE ELECTROACOUSTIC SYSTEM

Herbert F. Wighard, 9122 S. Federal Hwy., Suite 258, Port St. Lucie, Fla. 34952

Filed Sep. 24, 1996, Ser. No. 719,393

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 **24 Claims**



1. A electroacoustic cooling engine for cooling or heating a fluid working load, said engine comprising:

a vessel for containing a compressible fluid which is capable of supporting an acoustic standing wave having a predetermined wavelength, said vessel having a first volume and a second volume;

driving means, supported by said vessel, for cyclically driving said compressible fluid to simultaneously generate a first standing acoustic wave in said first volume and a second standing acoustic wave in said second volume;

thermodynamic means, positioned inside said first volume and said second volume, for thermally and independently responding to said first acoustic standing wave and said second acoustic standing wave so that said first and second acoustic standing wave independently cause heat to be pumped towards said driving means;

heat conductor means, in thermal communication with said thermodynamic means, for conducting heat away from said thermodynamic means; and

cooling means supported by said vessel for cooling the fluid working load, said cooling means being in thermal communication with said thermodynamic means.

5,813,235

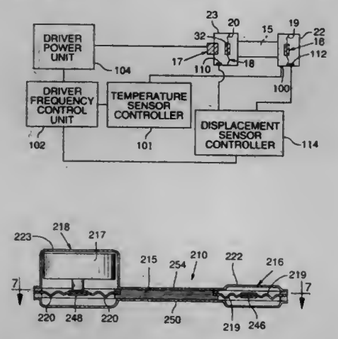
RESONANTLY COUPLED α-STIRLING COOLER

Richard B. Peterson, Corvallis, Oreg., assignor to The State of Oregon Acting by and through the State Board of Higher Education on Behalf of Oregon State University, Corvallis, Oreg.

Filed Feb. 24, 1997, Ser. No. 804,932

Int. Cl.[6] F25B *9/00;* **F01B** *29/10*

U.S. Cl. 62—6 **11 Claims**



1. An a Stirling cooler comprising:

a gas-tight vessel defining hot and cold variable-volume chambers and a passageway which connects the chambers;

a regenerator located in the passageway;

a variable-frequency driver for varying the volume of one of the variable-volume chambers, the driver providing an appropriately tuned force for maintaining reciprocating gas displacement between the variable-volume chambers, with changes in the volume of the other of the variable-volume chambers responding passively through resonant coupling to changes in the volume of the one variable-volume chamber; and

an adjustment system for varying the frequency of the driver and thereby altering the phase difference between the oscillations of the volumes of the variable-volume chambers.

5,813,236

Patent Not Issued For This Number

5,813,237

CRYOGENIC APPARATUS AND METHOD FOR SPRAYING A CRYOGEN INCORPORATING GENERATION OF TWO PHASE FLOW

Mark Thomas Grace, Bridgewater, N.J.; Michael Bruce Pooley, London, England; David G. Wardle, Bridgewater, and Ron C. Lee, Bloomsbury, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Jun. 27, 1997, Ser. No. 884,423

Int. Cl.[6] F17C *7/02;* **F25D** *17/02*

U.S. Cl. 62—52.1 **23 Claims**

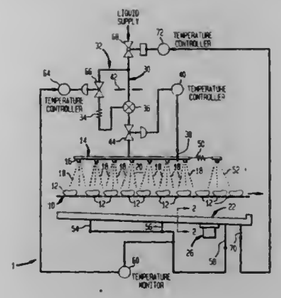
15. A method of spraying a cryogen having a liquid content, said method comprising:

spraying a heat load with said cryogen within a spray zone; and

vaporizing overspray formed from the liquid content of the cryogen through direct heat transfer with a heat conductive element positioned beneath said spray zone and having a surface sized to catch the overspray.

22. A method of spraying a liquid cryogen, said method comprising:

dividing said liquid cryogen into first and second subsidiary streams;



vaporizing the second subsidiary stream;

mixing the first and second subsidiary streams, after vaporization of the second subsidiary stream, thereby to produce a two phase flow; and

spraying said two phase flow.

5,813,238

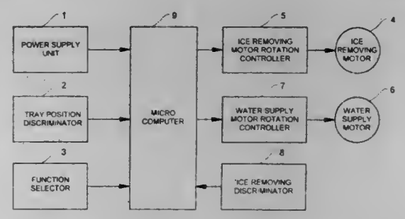
AUTOMATIC ICE PRODUCTION APPARATUS

Kun Bin Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 726,791, Oct. 7, 1996. This application Sep. 24, 1997, Ser. No. 936,628

Int. Cl.[6] F25C *5/06*

U.S. Cl. 62—71 **9 Claims**



1. An automatic ice production method, comprising the steps of:

alternatively performing a normal direction ice removing operation and a reverse direction ice removing operation of an ice removing motor;

controlling the operation of said ice removing motor in response to a signal from an overload state;

detecting the level of water in said water supply tank and, if the detected water level is below a predetermined value, generating an alarm;

stopping said automatic ice production function and preferentially supplying water to a water dispenser when automatic ice production and water dispensing are simultaneously enabled; and

feeding water remaining in a water supply hose back to said water supply tank following a refill of an automatic ice tray.

5,813,239

Patent Not Issued For This Number

5,813,240

METHOD FOR CONSTRUCTING A REFRIGERATING CYCLE INCLUDING A PROCESS OF REMOVING OXYGEN

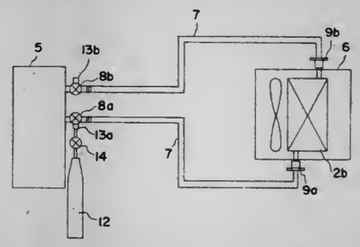
Shigehiro Sato, Osaka; Katsuya Wakita, Nara; Yusuke Ozaki, Toyonaka; Keizo Nakajima, Kawachinagano; Nobuo Sonoda, Settsu, and Tetsuji Kawakami, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 748,351, Nov. 14, 1996, abandoned. This application Sep. 25, 1997, Ser. No. 937,440

Claims priority, application Japan, Nov. 14, 1995, 7-295063; Mar. 1, 1996, 8-043932

Int. Cl.[6] F25B *47/00*

U.S. Cl. 62—85 **26 Claims**



1. A method for constructing a refrigerating cycle that has a first unit having a refrigerating compressor which is filled with a quantity of working medium and a first heat exchanger, and a second unit having a second heat exchanger that is located in an area of air conditioning and refrigeration, wherein the units are connected with each other by piping, the method comprising the steps of:

connecting the first unit having the refrigerating compressor and the first heat exchanger with the second unit having the second heat exchanger that is located in an area of air conditioning and refrigeration by means of piping;

removing oxygen in a system of the refrigerating cycle by providing an oxygen absorbent in a refrigerant circulating path;

separating the oxygen absorbent from the refrigerating cycle; and

circulating a refrigerant in the refrigerating cycle.

5,813,241

CRYTALLIZATION DETECTION AND RECOVERY FOR TWO-STAGE ABSORPTION REFRIGERATION MACHINE

Lee Sibik, and Mark Berget, both of Onalaska, Wis., assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 24, 1997, Ser. No. 823,084

Int. Cl.[6] F25B *15/00*

U.S. Cl. 62—148 **9 Claims**

1. A method for detecting crystallization in a two-stage absorption refrigeration machine (**100**) comprising a controller (**153**), an absorber (**106**), an evaporator (**105**), a high temperature generator (**107**), a low temperature generator (**101**), a condenser (**102**), a low temperature heat exchanger (**126**) for placing concentrated absorbent solution from the high temperature and low temperature generators (**107**, **101**) and dilute absorbent solution from the absorber (**106**) in a heat exchange relationship, a first passage (**127**) directing concentrated absorbent solution through the low temperature heat exchanger (**126**), a second passage (**124**) directing concentrated absorbent solution from the low temperature generator (**101**) to the first passage (**127**), a third passage (**123**) for directing concentrated absorbent solution from the high temperature generator (**107**) to the first passage (**127**), a fourth passage (**116**) for directing concentrated absorbent solution from the low

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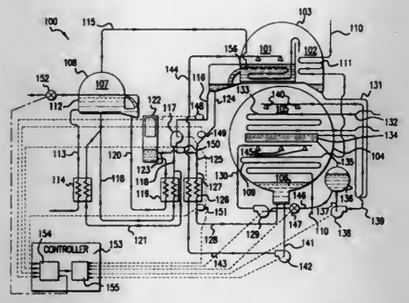


temperature generator to the high temperature generator, the method comprising the steps of:

a. sensing the temperature of the concentrated absorbent solution in the second passage (**124**);

b. sensing the temperature of the concentrated absorbent solution in the third passage (**123**);

c. sensing the temperature of the concentrated absorbent solution in the fourth passage (**116**); and

d. generating a control signal alerting of crystallization in the concentrated absorbent solution in the first passage (**127**) when the temperature of the concentrated absorbent solution in the second passage (**124**) meets or exceeds the average of the temperature of the concentrated absorbent solution in the third passage (**123**) and the temperature of the concentrated solution in the fourth passage (**116**), the average determined according to the formula:

$$T_{average} = \frac{T_3 + T_4}{2}$$

where T_3 is the temperature of the concentrated absorbent solution in the third passage (**123**) and T_4 is the temperature of the concentrated absorbent solution in the fourth passage (**116**).

5,813,242

DEFROST CONTROL METHOD AND APPARATUS

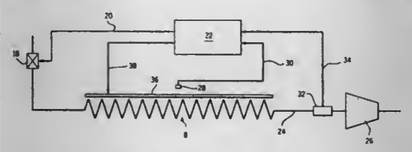
John M.W. Lawrence, Newbury, and Brian C. Parker, Ryton, both of United Kingdom, assignors to JTL Systems Limited, Berkshire, United Kingdom

Filed Jul. 2, 1997, Ser. No. 886,434

Claims priority, application United Kingdom, Jul. 5, 1996, 9614157

Int. Cl.[6] **F25B** *47/02*

U.S. Cl. 62—156 **14 Claims**



1. Apparatus for controlling defrosting of an evaporator in a heat transfer system, comprising:

a superheat detector for detecting whether the superheat of refrigerant at an outlet of the evaporator is at or below a predetermined level, a temperature detector for detecting whether the temperature of a thermal load cooled by the evaporator is above a maximum level and defrost control means responsive to said superheat detector and said temperature detector to initiate defrosting of the evaporator in response to the temperature of the thermal load being above said maximum level and the superheat of the refrigerant being at or below said predetermined level.

5,813,243

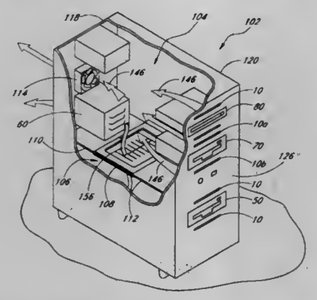
CHAMBERED FORCED COOLING SYSTEM

Greg P. Johnson, Boise; Rick Larsen, and Craig L. Boe, both of Nampa, all of Id., assignors to Micron Electronics, Inc., Nampa, Id.

Filed Apr. 4, 1997, Ser. No. 835,138

Int. Cl.[6] **F25D** *23/12;* **H05K** *7/20*

U.S. Cl. 62—259.2 **24 Claims**



19. A computer baffle, comprising:

a support element having a passage therethrough; and

a plurality of substantially coplanar individually moveable fingers, wherein said fingers are flexibly and resiliently attached to said support element and are disposed substantially within said passage, said fingers allowing the insertion of cabling through said passage, and further configured to substantially restrict airflow through said passage and around said cabling.

5,813,244

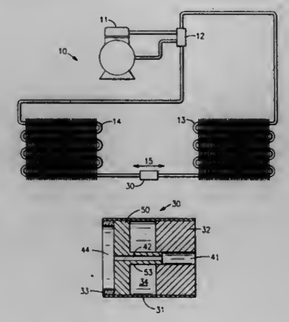
BIDIRECTIONAL FLOW CONTROL DEVICE

John M. Palmer, Cicero, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 758,131, Nov. 25, 1996, abandoned. This application Aug. 18, 1997, Ser. No. 912,729

Int. Cl.[6] **F25B** *13/00*

U.S. Cl. 62—324.6 **4 Claims**



1. A device for controlling the flow of a fluid in a conduit both a first and second direction comprising:

an elongated body having a first end wall and a second end wall defining an internal chamber therebetween;

the first end wall having at least one bypass opening axially extending therethrough and in communication with the internal chamber;

the second end wall having a first metering orifice axially extending therethrough;

a foreshortened piston disposed in the internal chamber and being slidably movable axially in response to fluid flow, the piston having a first end face parallel to the first end wall and a second end face parallel to the second end wall;

a rod portion extending from the second end face slidably disposed within the first metering orifice;

the piston and rod portion further having a second metering orifice extending therethrough and in axial alignment with the first metering orifice;

whereby the piston meters flow-through the second metering orifice in a first fluid flow direction and meters flow serially through the first orifice and thence the second orifice in a second fluid flow direction and permits the fluid to flow into the conduit.

5,813,245

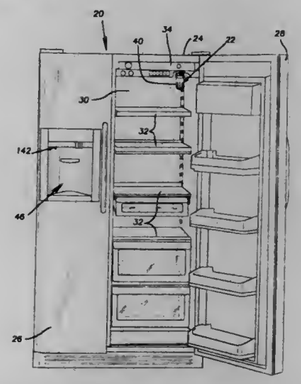
PRESSURE RELIEF CIRCUIT FOR REFRIGERATOR CONTAINED WATER FILTER

Donald A. Coates, Worthington, and Kenneth E. Morris, Dublin, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Oct. 25, 1996, Ser. No. 740,262

Int. Cl.[6] **F25D** *23/12;* **B67D** *5/62;* **B01D** *17/12*

U.S. Cl. 62—338 **23 Claims**



18. A refrigerator comprising:

a cabinet having a plurality of insulated walls;

a refrigerator door pivotally mounted to said cabinet and cooperating to form a refrigeration compartment;

a freezer door pivotally mounted to said cabinet and cooperating to form a freezer compartment; and

a filtration and dispensing system including, a first control valve for unfiltered water, a first water supply line for fluidly connecting said first control valve to a source of household water, a water filter assembly disposed within said refrigeration compartment and having an inlet and an outlet, a second water supply line fluidly connecting said first control valve to said inlet of said water filter assembly, a second control valve having an inlet and first and second outlets, a third water supply line fluidly connecting said outlet of said water filter assembly to said inlet of said second control valve, a filtered water dispenser fluidly connected to said first outlet of second control valve, an ice maker disposed within said freezer compartment and fluidly connected to said second outlet of said second control valve, a water dispenser switch connected to said first and second control valves, an ice maker switch connected to said first and second control valves for opening said first control valve and said second outlet of said second control valve to permit unfiltered water to flow into said water filter assembly and to permit filtered water to flow into said ice maker, and a pressure-relief switch connecting said water dispenser switch and said first control valve and having closed and open positions, whereby actuation of said water dispenser switch opens said first and second control valves when said pressure-relief switch is in said closed position to permit unfiltered water to flow into said water filter assembly and to permit filtered water to flow out of said water dispenser, and whereby actuation of said water dispenser switch opens said second control valve but not said first control valve when said pressure-relief switch is in said open position to prevent unfiltered water from flowing into said water filter assembly and permit filtered water to flow out of said water dispenser.

5,813,246

WATER DISPENSER FOR A REFRIGERATOR

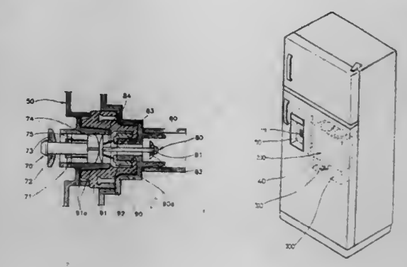
Gil-Soo Oh, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 27, 1996, Ser. No. 757,545

Claims priority, application Rep. of Korea, Dec. 5, 1995, 1995 46769; Dec. 9, 1995, 1995 48134

Int. Cl.[6] **B67D** *5/62*

U.S. Cl. 62—391 **9 Claims**



1. A water dispenser adapted for use in a refrigerator, comprising:

a water tank adapted to be removably disposed in a refrigerating compartment and including a substantially horizontally facing water discharge outlet;

a water dispensing outlet adapted to be mounted in a refrigerator door;

a water feed pipe including an outlet end connected to the dispensing outlet and a substantially horizontally facing inlet end removably attached to the discharge outlet;

first and second valves mounted in the discharge outlet and inlet end, respectively, for automatically closing in response to the discharge end being disconnected from the inlet end, and for automatically opening in response to the discharge outlet being connected to the inlet end; and

first and second springs arranged to bias said first and second valves, respectively, to positions closing the discharge outlet and inlet end, respectively, each of said valves including opposite first and second ends, said first ends of said first and second valves including respective closure caps for closing the discharge outlet and inlet end, respectively, under the bias of the first and second springs, said second ends of said first and second valves including respective pressing members facing one another and arranged for mutual engagement to force the respective closure caps to an open state in response to the discharge outlet being connected to the inlet end.

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5,813,247

APPARATUS CABINET FOR PROVIDING OF PROCESS

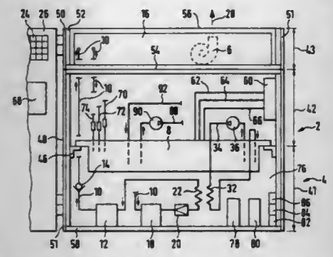
Klaus Strobl, Inchenhofen, Germany, assignor to Baldwin-Gegeheimer GmbH, Augsburg, Germany

Continuation of Ser. No. 546,491, Oct. 20, 1995, abandoned. This application Nov. 5, 1997, Ser. No. 968,874

Claims priority, application Germany, Nov. 11, 1994, 44 40 380.1

Int. Cl.[6] F25D *17/02*

U.S. Cl. 62—434 **20 Claims**



1. An apparatus cabinet for providing process water for printing presses, the cabinet including

a housing which includes three levels, a bottom level, an intermediate level and a top level; and in the housing:

a water conditioning device including a conditioning container disposed generally at the intermediate level for conditioning process water with respect to the components thereof and the temperature thereof, the conditioning container being arranged in the intermediate level at an operating height between the knee height and the chest height of an average height operator;

a water temperature control device in the housing for controlling the temperature of the process water in the conditioning container, the water temperature control device including a coolant circuit for conveying coolant in the flow direction of the coolant, the coolant circuit comprises a cooling compressor for compressing the coolant, the compressor being disposed in the bottom level of the housing; a cooling condenser in the top level of the housing means for cooling the coolant in the condenser also disposed in the top level of the housing, and the coolant circuit further includes means in the circuit for collecting coolant;

in the housing, a heat exchanger through which the coolant passes, and the heat exchanger communicating with the process water for cooling the process water.

5,813,248

BALANCED ADSORBENT REFRIGERATOR

David A. Zornes, 4343 202nd Ave. Northeast, Redmond, Wash. 98053, and John J. Bauer, 44714 SE. 161st Pl., North Bend, Wash. 98045

Filed Nov. 1, 1996, Ser. No. 742,387

Int. Cl.[6] F25B *17/08*

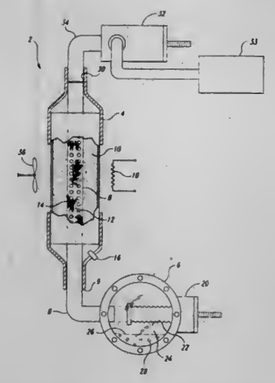
U.S. Cl. 62—480 **40 Claims**

1. A heat transfer apparatus which uses a heat source to generate a cooling effect, the apparatus comprising:

a first vessel having a first aperture and containing an adsorbent material having an adsorbing capacity;

a second vessel having a second aperture, the second aperture connected to the first aperture of the first vessel with a conduit, the conduit providing a fluid passage between the vessels, the vessels and the conduit forming a sealed volume capable of maintaining less than atmospheric pressure therein; and

a quantity of working substance within the scaled volume, the quantity including a portion of working substance in the second vessel, the working substance being capable of being



strongly adsorbed by the absorbent material, the adsorbing capacity of the adsorbent material being sufficient to adsorb by sublimation at least part of the portion of working substance in the second vessel when substantially the entire portion of working substance in the second vessel is in a solid state.

5,813,249

REFRIGERATION CYCLE

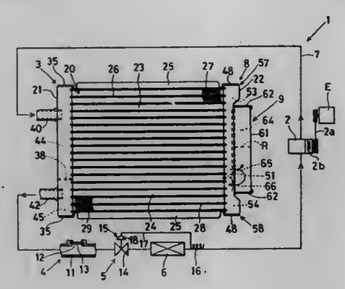
Hiroki Matsuo, Kariya, and Kaoru Tsuzuki, Ichinomiya, both of Japan, assignors to Denso Corporation, Kariya, Japan

Continuation of Ser. No. 680,624, Jul. 17, 1996, abandoned. This application Aug. 11, 1997, Ser. No. 909,378

Claims priority, application Japan, Jul. 18, 1995, 7-181407

Int. Cl.[6] F25B *39/04*

U.S. Cl. 62—509 **22 Claims**



1. A refrigeration apparatus comprising:

a compressor for compressing refrigerant;

a condenser of volume capacity VCOND1, said condenser having a plurality of condensing tube members for condensing said refrigerant that flows therein from said compressor and a converging member of volume capacity Vh1 for converging said refrigerant that flows therein from said plurality of condensing tube members;

a receiver of required volume capacity VR for separating said refrigerant from said converging member of said condenser into gaseous refrigerant and liquid refrigerant and discharging said liquid refrigerant;

a supercooler of volume capacity VCOND2, said supercooler having a distributing member of volume capacity Vh2 for distributing said refrigerant discharged by said receiver and a supercooling tube member of volume capacity VSC for supercooling said refrigerant that flows therein from said refrigerant distributing member;

a thermostatic expansion valve for expanding said refrigerant that flows therein; and

an evaporator of volume capacity VEVA for evaporating said refrigerant that flows therein from said thermostatic expansion valve,

wherein said VR satisfies the following relationship:

$$VR=L\times(V1+V2-V3)\ cc,$$

in which

$$V1=1.52\times10^{-3}\times(VCOND1+VCOND2)+34.3\times10^{-3}\times VEVA\ cc,$$

$$V2=170\ cc,$$

$$V3=0.65\times(Vh1+Vh2+VSC)\ cc\ and$$

L is a predetermined coefficient.

5,813,250

GAS LIQUEFYING METHOD AND HEAT EXCHANGER USED IN GAS LIQUEFYING METHOD

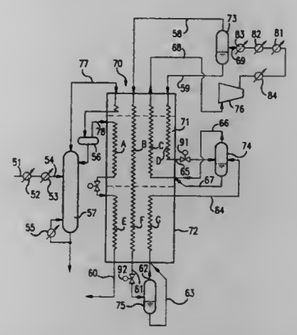
Koichi Ueno, and Kenichiro Mitsuhashi, both of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Division of Ser. No. 569,901, Dec. 8, 1995, Pat. No. 5,644,931. This application Mar. 25, 1997, Ser. No. 823,165

Claims priority, application Japan, Dec. 9, 1994, 6-331942; Dec. 9, 1994, 6-331943

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—612 **3 Claims**



1. A heat exchanging device of a gas liquefying plant comprising:

a pre-cooling section with a single component refrigerant system;

a liquefying section with a multi-component refrigerant system, wherein said liquefying section has a plate-fin type heat exchanger, and said plate-fin type heat exchanger is installed in a vertical orientation with its hot end being set at an upper part of a refrigerating container and its cold end being set at a lower part of the refrigerating container.

5,813,251

PROCESS AND APPARATUS FOR LOW-TEMPERATURE SEPARATION OF AIR

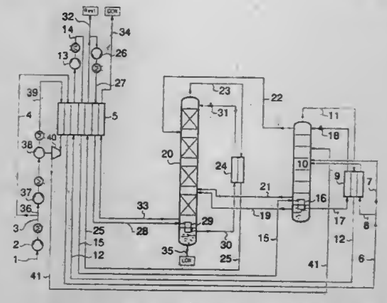
Jürgen Voit, Schondorf, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Nov. 21, 1996, Ser. No. 752,947

Claims priority, application Germany, Nov. 21, 1995, 195 43 395.5

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—646 **19 Claims**



1. A process for the low-temperature separation of air in a rectifying column system comprising a preliminary separation column (**10**) and a low-pressure column (**20**), said process comprising introducing feed air (**1**, **3**) into said preliminary separation column (**10**), withdrawing a nitrogen-enriched fraction and an oxygen-enriched bottom fraction from said preliminary separation column (**10**), introducing at least a portion (**19**) of the oxygen-enriched bottom fraction into the low-pressure column (**20**), and withdrawing liquid oxygen and gaseous nitrogen in said low-pressure column (**20**), characterized in that the pressure in preliminary separation column (**10**) is essentially equal to the pressure in low-pressure column (**20**).

5,813,252

FRACTIONATION COLUMN

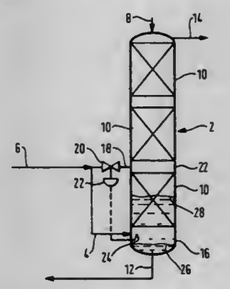
Paul Higginbotham, Surrey, England, assignor to The BOC Group plc, Windlesham, England

Filed Aug. 21, 1997, Ser. No. 918,527

Claims priority, application United Kingdom, Aug. 22, 1996, 9617642

Int. Cl.[6] F25J *1/00*

U.S. Cl. 62—656 **12 Claims**



1. A fractionation column including:

a first vapour inlet to a bottom mass exchange region of the column communicating with a source of vapour mixture to be separated;

a second vapour inlet to an intermediate mass exchange region of the column; and

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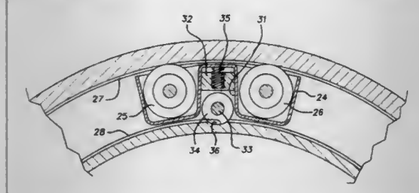
valve means operable to place the second inlet selectively in communication with the source of vapour mixture to be separated.

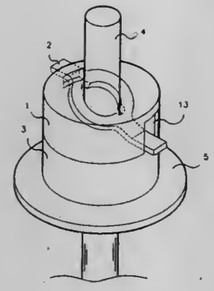
5,813,253
ARRANGEMENT FOR BALANCING OF A BODY ROTATABLE ABOUT AN AXIS
Stig Göran Uhlin, Lagan, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
PCT No. PCT/SE95/00881, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO96/03541, PCT Pub. Date Feb. 8, 1996
PCT Filed Jul. 21, 1995, Ser. No. 776,326
Claims priority, application Sweden, Jul. 26, 1994, 9402577
Int. Cl.[6] D06F *37/22*
U.S. Cl. 68—23.2 **11 Claims**



1. Arrangement for balancing of a main mass (14) having an imbalance and rotating about an axis (18), said balancing being made by means of balancing masses (23;24) which are relatively freely moveable with respect to the main mass (14) and disposed in at least one closed path (22) symmetrically positioned around said axis (18), said main mass (14) being adapted to be rotated at speeds both below and above a critical speed and the path (22) being connected with the main mass (14) so as to rotate in synchronism therewith, locking means (34,36;42,43) being provided for locking the balancing masses (23;24) relative to the path (22) at rotating speeds below the critical speed and for releasing the balancing masses (23;24) for movement relative to the path (22) at rotating speeds above the critical speed, wherein the locking means (34,36;42,43) are operable to cause the balancing masses (23;24) to automatically take a locking position (A', B', C') provided for each balancing mass (23;24) when the main mass (14) is rotated at speeds below the critical speed, said locking positions (A', B', C') being evenly interspaced along the periphery of the path (22).

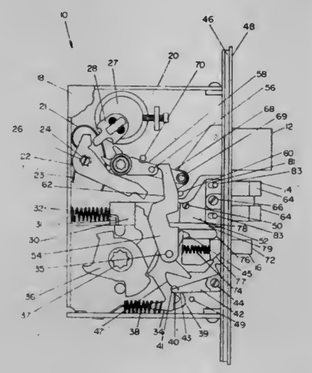
5,813,254
STAGELESS QUICK CLAMPING HANDLE DEVICE FOR DYEING SPINDLE OF YARNCHEESE
Yung-Sho Yang, 3F, No. 20, Alley 23, Lane 281, Sec. 3, Chungyang Rd., Tucheng City, Taipe Hsien, Taiwan
Filed Feb. 11, 1997, Ser. No. 798,551
Int. Cl.[6] D06B *5/18;23/00*
U.S. Cl. 68—212 **10 Claims**

1. A stageless quick clamping handle device for dyeing spindle of yarncheese, comprising an upper cap, a clamping plate, a lower cap, a fitting rod, a spacer and a spindle, wherein:
the upper cap is formed with a central hole and a peripheral wall of the upper cap is formed with an engaging window and a handle opening opposite to each other;
the clamping plate is placed in the upper cap and formed with a central hole, the clamping plate having a fulcrum end passing through the engaging window and a free end passing through the handle opening for a user to pull the clamping plate; and
the lower cap is formed with a central hole corresponding to the central hole of the upper cap, whereby when assembled, the clamping plate is placed in the upper cap with the fulcrum end



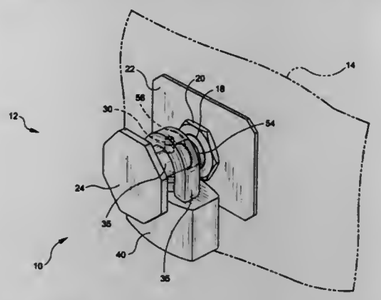
extending through the engaging window and the free end protruding out of the handle opening and then the upper cap is secured on the upper side of the lower cap and the fitting rod is downward sequentially snugly passed through the central hole of the upper cap, the central hole of the clamping plate and the central hole of the lower cap and the spacer to connect with the upper end of the spindle.

5,813,255
LOCK MECHANISM WITH CLOSED CASE CHANGEOVERS
William Tell, III, Lancaster, and Samuel R. Weigard, Columbia, both of Pa., assignors to PDQ Industries, Inc., Leola, Pa.
Filed Sep. 25, 1996, Ser. No. 719,998
Int. Cl.[6] E05B *59/00*
U.S. Cl. 70—107 **2 Claims**



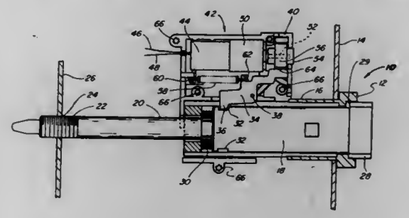
1. In a lock assembly of the type in which a case encloses a latchbolt; a rotating retractor interconnected with the latchbolt, the retractor retracting the latchbolt when rotated by a manual lever; and a deadbolt which can be extended and retracted; the improvement comprising:
a deadbolt pin interconnected with the deadbolt so that moving the deadbolt pin moves the deadbolt;
a pivoting egress lever installed within the case which moves the pin to retract the deadbolt; and
a screw which is installable and removable through a hole in the case, the screw, when installed, being interconnected with the latchbolt so that retraction of the latchbolt moves the screw into contact with the egress lever and pivots the egress lever so that the deadbolt is retracted with retraction of the latchbolt.

5,813,256
THEFT DETERRENT LOCK FOR AN AIR BRAKE CONTROL VALVE
Arthur von Hagen, 1163 Beach Ave., Bronx, N.Y. 10472
Filed Aug. 7, 1996, Ser. No. 687,054
Int. Cl.[6] F16K *35/00*
U.S. Cl. 70—177 **20 Claims**



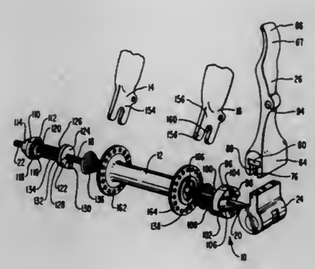
1. In combination:
a vehicular control device having an inward and outward axially moving shaft with first and second ends; and
an anti-theft device an comprising:
a locking pin extending from said shaft; and
a locking device adapted for removable coupling about said shaft for engaging said locking pin and substantially preventing said inward axial movement of said shaft.

5,813,257
ELECTRICALLY CONTROLLABLE LOCKING DEVICE FOR VENDING MACHINES AND THE LIKE
Roger O. Claghorn, St. Louis, and Joseph L. Levasseur, Chesterfield, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.
Filed Jun. 25, 1997, Ser. No. 882,093
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—208 **14 Claims**



1. An electrically controllable locking device adapted for use in association with a lock assembly for securing a cabinet door to a cabinet, the lock assembly including a handle formed integrally with a handle lock barrel having an outer surface and a lock bolt extending from an end thereof, the lock bolt having an interiorly threaded end for threadedly engaging an interior portion of the cabinet, the handle lock barrel positioned within a lock guide formed integrally with a handle flange which includes a handle recess into which the handle may be positioned, said electrically controllable locking device comprising,
at least one groove formed in the outer surface of the handle lock barrel;
a motor assembly having a rotatable shaft extending therefrom;
a cam member mounted on the motor assembly shaft for rotation therewith, the cam member including a cam surface; and
a latch member having a first portion which is biased toward the lock barrel and is positioned within the lock barrel groove when the handle is positioned within the handle recess of the handle flange, the latch member having a second portion which is biased toward the cam member and is positioned to contact at least a portion of the cam surface during rotation of the cam member.

5,813,258
QUICK RELEASE LOCKING SYSTEMS
Nick Cova, 948 S. 900 East, Salt Lake City, Utah 84105, and Shawn Lyons-Smith, 3211 Bellomy La., Boise, Id. 83703
Filed Sep. 18, 1996, Ser. No. 724,269
Int. Cl.[6] E05B *71/00*
U.S. Cl. 70—225 **20 Claims**



1. A camming lock system comprising:
(a) an axle having opposing ends with an exterior surface extending therebetween;
(b) a cam comprising:
(i) an interior surface defining a receiving chamber longitudinally positioned within the cam, the receiving chamber being configured to receive the axle so that the cam can rotate about the axle; and
(ii) an exterior surface asymmetrically formed around the interior surface of the cam so that the distance between the interior surface and the exterior surface varies at points around the cam;
(c) means for selectively locking the axle to the cam to prevent annular rotation of the axle relative to the cam; and
(d) means at least partially removably connected to the cam for unlocking the axle and the cam and for enabling leveraged rotation of the cam relative to the axle.

5,813,259
LOCKING DEVICE
Larry Randal Martin, 11608 Cannongate Rd., Cabot, Ark. 72023
Filed Aug. 20, 1996, Ser. No. 699,980
Int. Cl.[6] E05B *71/00*
U.S. Cl. 70—234 **1 Claim**

1. A locking device for securing portable objects and for preventing unauthorized removal of said objects comprising:
a base having a horizontal hollow tube and an attached hollow vertical shank of a predetermined length, said tube and said shank each having a free wheeling solid metal bar mounted therein; said vertical shank further having an auger attached to a distal end thereof; said auger being adapted to be screwed securely into the ground to an appropriate depth such that the base is securely mounted to the ground;
a hollow yoke having three sides configured to form a U-shape, each said side of said yoke having mounted therein a free

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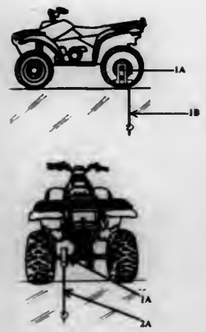
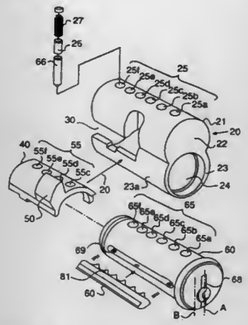


wheeling solid metal bar; each distal end of the yoke having securing means for slidably attaching the yoke onto the hollow tube of the base;

in use, said yoke is inverted and adapted to be placed over or around a part of the object prior to being secured and interconnected to the base by said securing means;

said horizontal tube and said securing means each having an aperture adapted to be aligned so that the device can be locked by a lock mechanism.

5,813,260
REMOVABLE CORE CYLINDER LOCK
Bo Widén, Torshälla, Sweden, assignor to Winloc AG, Zug, Sweden
Continuation of Ser. No. 501,864, Jul. 13, 1995, abandoned.
This application Jun. 26, 1997, Ser. No. 883,428
Claims priority, application Sweden, May 18, 1995, 9501856
Int. Cl.[6] E05B *27/00*
U.S. Cl. 70—369 **20 Claims**



1. A removable core cylinder lock, comprising:

a cylinder lock casing having an axially extending cavity;

a removable cylinder lock core which is axially insertable into said cavity, said lock core having an upper massive part with a row of holes for accommodating locking tumblers and a lower part defining a cylindrical bore extending axially therethrough;

a cylindrical, rotatable key plug located in said cylindrical bore and having a longitudinal key slot for receiving a key cooperating with said locking tumblers; and

a retainer member being transversely movable between a first position, in which the retainer member positively locks said lock core in an axially inserted position, and a second position, in which said lock core may be retracted, said retainer member having a transversely extending locking lug engaging with said casing when said retainer member is in said first position; wherein

said lower part defining the cylindrical bore of the cylinder lock core is partially cut away so as to form an axially extending chamber accommodating said transversely movable retainer member and leaving a continuous lower wall portion, which partially encloses the rotatable key plug and extends axially along substantially the whole length of said cylindrical bore,

said retainer member has a limited circumferential extension, which is substantially supplementary to said continuous lower wall portion so as to define said cylindrical bore,

said accommodating chamber is upwardly extended into said upper massive part of the cylinder lock core,

said retainer member comprises a base portion, which is formed substantially as a part-cylindrical shell with external and internal cylindrical surfaces, and a radially outwardly projecting portion constituting said locking lug,

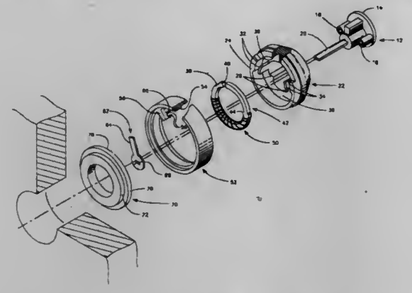
said accommodating chamber is upwardly defined by a concave cylindrical surface,

the retainer member has a corresponding upper convex cylindrical surface, said retainer member being rotatable between said first and second positions with a sliding contact between said concave and convex surfaces,

the circumferential dimension of said base portion is less than the circumferential dimension of said accommodating chamber, and

said base portion and said lower wall portion have longitudinal abutment surface portions defining said first and second positions of the retainer member.

5,813,261
KEYLESS DEADBOLT LOCK ENGAGING DEVICE
Robert D. Boehlow, 1212B W. Main, Festus, Mo. 63028
Filed Oct. 31, 1996, Ser. No. 742,133
Int. Cl.[6] E05B *9/10*
U.S. Cl. 70—379 R **1 Claim**



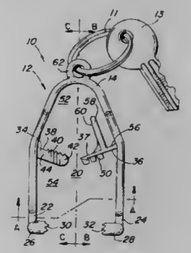
1. A keyless deadbolt lock engaging apparatus for use with a conventional deadbolt assembly, the apparatus comprising:

an actuator means to engage the deadbolt assembly, the actuator means including of a radial actuator engaging the deadbolt assembly and further including an arm member;

a rotational means the rotational means including a rotatable ring having an inwardly projecting center projection capable of operatively engaging the arm member, the rotational means capable of rotating from a first position whereby the actuator means is moved to a deadbolt disengaged position to a second position whereby the actuator means is in a deadbolt engaged position; and

a biasing means to return the rotational means from a second position to the first position while the actuator means remains in the deadbolt engaged position, the biasing means including the combination of a spring ring proximate the rotational means and movable with respect to the rotational means and a spring member associated with the ring whereby the spring member returns the rotational means from the second position to the first position.

5,813,262
KEY RING ASSEMBLY
Gerald B. Crumley, Castaic; Steven M. Kavitky, and Sterling Attwood Kavitky, both of Woodland Hills, all of Calif., assignors to Sterling Attwood Enterprises, Inc., Woodland Hills, Calif.
Filed Jun. 9, 1997, Ser. No. 871,464
Int. Cl.[6] A44B *15/00*
U.S. Cl. 70—457 **8 Claims**



1. An improved key ring assembly, said key ring assembly comprising, in combination:

a) a key ring carrying one or more keys;

b) a clamping member attached to said key ring;

c) said clamping member having a generally inverted U-shaped upper end and first and second diverging and depending spaced resilient legs defining a central space therebetween, the lower ends of said legs bearing opposed claws, said claws being movable by finger pressure on said legs between a normally open spaced position and a closed article-engaging position;

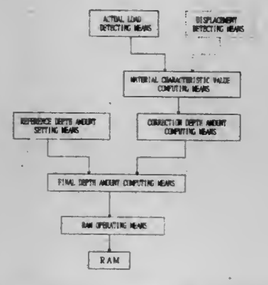
d) releasable locking means, said locking means comprising:

i.) a first integral elongated bar connected to the inner surface of said first of said legs, extending inwardly into said central space, disposed upwardly from said claws and bearing teeth on the upper surface thereof; and

ii.) a second integral elongated bar connected to the inner surface of the second of said legs, disposed upwardly from said claws and extending inwardly into said central space for releasable engagement with said first bar, said second bar having at least one tooth extending downwardly at the end of said second bar which is releasably engagable with said teeth of said first bar to releasably lock said member in the closed key-retaining, claw-clamping position, said second bar also bearing on the upper surface thereof an upwardly projecting integral lever arm for moving said second bar tooth out of engagement with said teeth of said first bar, and

e) advertising indicia disposed on at least one of a) the inner surface of at least one of said legs, b) the outer surface of at least one of said legs, and c) a surface of said first bar.

5,813,263
RAM POSITION SETTING METHOD AND RAM CONTROL UNIT FOR PRESS BRAKE
Shigeru Tokai, Ishikawa, Japan, assignor to Komatsu, Ltd., Tokyo, Japan
Continuation of Ser. No. 619,509, Mar. 28, 1996, abandoned.
This application Aug. 27, 1997, Ser. No. 917,746
Claims priority, application Japan, Oct. 15, 1993, 5-258233
Int. Cl.[6] B21D *5/01*
U.S. Cl. 72—21.4 **8 Claims**



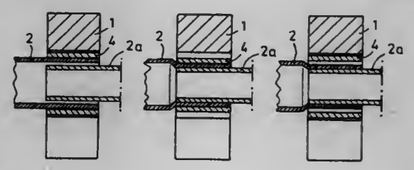
1. A ram position setting method for a press brake for bending a workpiece placed between a punch and die at a predetermined angle by reciprocating a ram between an upper limit position and a lower limit position, said method comprising the steps of:

obtaining a relationship between actual load exerted on the workpiece and displacement during bending of the workpiece;

obtaining one of yield stress and yield load as a specific material characteristic value that indicates a characteristic of the material of the workpiece from the actual load to displacement relationship; and

setting one of said upper limit position and said lower limit position for the ram based on the correlation between the material characteristic value and bending angle.

5,813,264
METHOD FOR FORMING A WORKPIECE BY A MAGNETIC FIELD GENERATED BY A CURRENT IMPULSE
Erich Steingroever, Bonn, Germany, assignor to Magnet-Physik Dr. Steingroever GmbH, Germany
Filed Nov. 15, 1996, Ser. No. 746,875
Claims priority, application Germany, Jan. 27, 1996, 196 02 951.1
Int. Cl.[6] B21D *26/14*
U.S. Cl. 72—56 **20 Claims**



1. A method for forming a workpiece by a magnetic field including the steps of:

producing a high current impulse;

producing said magnetic field by applying said high current impulse through a high current loop circuit located in its entirety outside said workpiece, whereby said magnetic field exerts a force on an electrically conducting object selected from the group comprised of workpiece compression rings and workpieces;

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beginning said high current impulse in the form of a half sine wave defined by the equation ($\omega t = 0 \ldots \pi$); and

reducing the cycle of said high current impulse to cause it to fade away as defined by the equation ($\omega t > \pi \ldots \infty$).

5,813,265

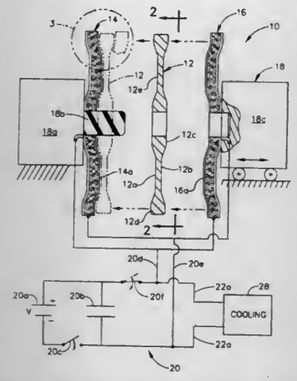
BALANCED ELECTROMAGNETIC PEENING

James S. Shaw, Hampton Falls, N.H., and Neil A. Johnson, Schenectady, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 12, 1997, Ser. No. 989,243

Int. Cl.[6] B21D *26/14*

U.S. Cl. 72—56 **10 Claims**



9. A method for electromagnetically peening a compressive layer in a machined component comprising:

producing a first electromagnetic force on one surface of said component;

producing a second electromagnetic force on an opposite surface of said component, substantially simultaneously with said first force to plastically deform said component at said first and second surfaces and effect said compressive layer therein.

5,813,266

METHOD OF FORMING AND PIERCING A TUBE

Stanley P. Ash, Greenville, Mich., assignor to Greenville Tool & Die Company, Greenville, Mich.

Continuation-in-part of Ser. No. 550,711, Oct. 31, 1995, Pat. No. 5,630,334. This application Dec. 11, 1996, Ser. No. 763,826

Int. Cl.[6] B21D *9/15;26/02*

U.S. Cl. 72—57 **17 Claims**

1. A method of cold forming a metal tube comprising:

filling a tube with a change-of-state material comprising water having a melting point lower than the melting point of the tube, the change-of-state material being in a liquid state;

freezing the change-of-state material to form a solid-filled tube;

sealing the solid-filled tube;

stamping the solid-filled tube in a die to form a stamped member;

melting the change-of-state material within the stamped member; and

draining the change-of-state material from the stamped member.

5,813,267

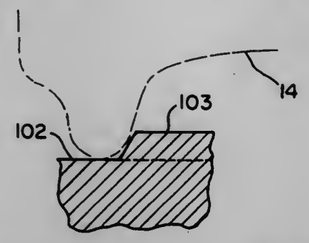
METHODS AND APPARATUS FOR REDUCING FLANGE WIDTH VARIATIONS IN DIE NECKED CONTAINER BODIES

Anton A. Aschberger, Downers Grove; James M. Abrahamson, Waukegan, and Isaac R. Dandan, Lombard, all of Ill., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Feb. 28, 1996, Ser. No. 608,125

Int. Cl.[6] B21D *51/26*

U.S. Cl. 72—125 **20 Claims**



1. Apparatus for deforming an open end of a container having an open end and a closed end, the closed end forming an annular base, the annular base having a bottom portion and an interior portion, comprising:

one or more deforming means adapted to be inserted into the container; and

a pusher pad having means for centering the container with respect to the deforming means, the centering means including:

(i) means for supporting the bottom portion of the container annular base, the supporting means including a flat surface against which the container bottom portion can rest;

(ii) means for engaging the interior portion of the container base, the engaging means including a pilot projecting outwardly from and being surrounded by the flat surface, the pilot having inclined sides adapted to mate with the interior portion of the annular base;

(iii) means for urging the container base into contact with the flat surface and the pilot, the urging means including means for creating a vacuum between the container base and the pusher pad.

5,813,268

BLOCK TO PROVIDE CURVATURE AND BALANCING FOR FOUR-HIGH ROLLING MILL STANDS TO PROCESS STRIP OR PLATE

Estore Donini, Vimercate, and Fausto Drigani, Zugliano, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

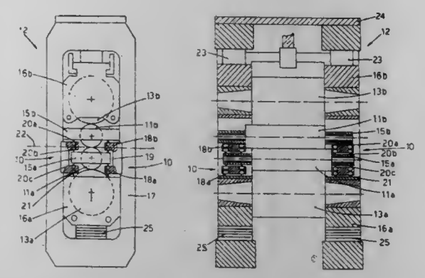
Filed May 24, 1996, Ser. No. 653,396

Claims priority, application Italy, May 25, 1995, UD95A0095

Int. Cl.[6] B21B *13/14;29/00;31/00*

U.S. Cl. 72—241.8 **7 Claims**

1. Block to provide curvature and balancing, which is suitable to impart an "IN" or "OUT" pre-curvature to at least one processing roll of a four-high rolling mill stand comprising lower and upper processing rolls respectively, each of which cooperates with a relative back-up roll, the processing rolls and back-up rolls coop-



erating at their two ends with respective chocks and relative bearings, the block comprising at least one lower rib and one upper rib, curvature jacks provided on respective inner surfaces of the at least one lower rib and one upper rib cooperating with the opposite surfaces of the chocks of the processing rolls, supporting jacks cooperating with the chocks of the back-up rolls, and surface compensation lacks provided on at least one rib which are actuated when an "OUT" pre-curvature is imparted to at least one processing roll associated with the block, the compensation jacks acting on the chocks of the corresponding back-up roll.

5,813,269

DIE ASSEMBLY FOR EXTRUDING HOLLOW METALLIC ARTICLES

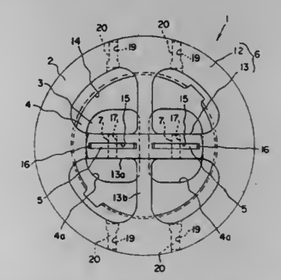
Sadahide Yano, Osaka, Japan, assignor to Yugen Kaisha Yano Engineering, Osaka, Japan

Filed Dec. 20, 1996, Ser. No. 771,262

Claims priority, application Japan, Dec. 22, 1995, 7-334437

Int. Cl.[6] B21C *23/02*

U.S. Cl. 72—261 **3 Claims**



1. A die assembly for simultaneously extruding a plurality of hollow metallic articles, the die assembly comprising:

a male die and a female die;

the male die comprising:

a plurality of cores each having a bearing lug at its end to define a hollow space through a hollow article extruded by the die assembly;

a core holder holding the cores therein and consisting of an annular portion and a bridge formed integrally with the annular portion, the annular portion of the core holder including a thick cylindrical member, and the bridge comprising a main bridge portion extending laterally across the annular portion and an auxiliary bridge extending vertically across the annular portion, the main bridge portion and the auxiliary bridge portion intersecting integrally with each other, the bridge formed with the cylindrical member at an upstream region of a cavity of the thick cylindrical member; and

a plurality of apertures penetrating the main bridge portion in the direction of extrusion, the apertures being for holding the cores and are of a shape to tightly fit the cores,

the cores respectively inserted and held in each aperture, with the bearing lug protruding over the main bridge portion, each core having an upstream region inwardly tapered in width toward the upstream end, so that clearances for absorbing deformation are provided between each side of the tapered region of the core and the inside wall of each aperture;

the female die comprising:

a plurality of bearing edges to contour a periphery of the hollow article,

the female die is fitted in a downstream region of the cavity of the thick cylindrical member and the male and female dies are combined together to form a plurality of slots independently of each other surrounded by the bearing lug of the male die and the bearing edges of the female die, and

a flow regulating piece in the cavity and between the male die and the female die.

5,813,270

CONTINUOUS EXTRUSION APPARATUS

Edward Purvis Carter, Gillingham, England, assignor to BWE Limited, Ashford, England

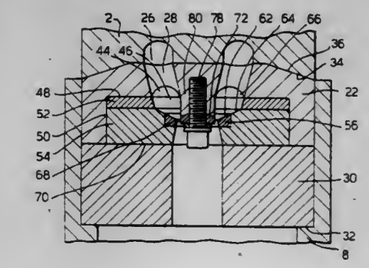
PCT No. PCT/GB96/00648, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO96/29162, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 15, 1996, Ser. No. 737,639

Claims priority, application United Kingdom, Mar. 17, 1995, 9505380

Int. Cl.[6] B21C *23/00*

U.S. Cl. 72—262 **4 Claims**



1. A continuous extrusion apparatus, comprising:

a) a rotatable wheel having a circumferential groove and a cylindrical surface;

b) an arcuate tooling bounding a radially outer portion of said groove;

c) said tooling having a die top with an exit aperture, a part cylindrical face being arranged to co-act with a portion of said cylindrical surface, and an end face remote from said part cylindrical face and having a central recess with an extrudate supply chamber, said exit aperature connecting said extrudate supply chamber to said circumferential groove;

d) said tooling having a central extrusion mandrel die being positioned centrally in said recess and being removably secured to said die top with a bolt;

e) said tooling having a die support ring carrying a cylindrical extrusion mandrel die being disposed within said recess and co-axially aligned with said central extrusion mandrel die providing an extrusion orifice therebetween;

f) said die support ring and said cylindrical extrusion mandrel die having frusto-conical surface portions converging to said extrusion orifice; and,

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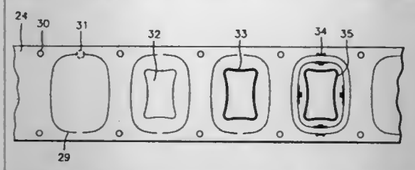
g) said tooling having an abutment being disposed to extend into said groove to displace a feed material in said groove through said exit aperature to said extrudate supply chamber and said extrusion orifice.

5,813,271
METHOD OF MANUFACTURING FRAME FOR CATHODE RAY TUBE

Eun Sub Lee, and Kyung Yul An, both of Kyungsangbuk-do, Rep. of Korea, assignors to Orion Metal Company Ltd., Gumi, Japan

Filed Feb. 20, 1997, Ser. No. 801,384
Int. Cl.[6] B21D *28/10*
U.S. Cl. 72—336 **1 Claim**



1. A method of manufacturing a frame for cathode ray tubes, comprising the progressive steps of:

blanking a workpiece while leaving junctions thereon and punching a transformable area of the workpiece to form pilot holes thereon;

piercing the blanked portion into the shape of a TV or monitor screen;

forming an edge of the pierced portion such that it bends inward; and

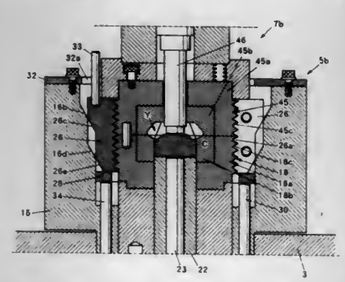
drawing the formed portion to be molded into a frame while notching the junctions,

wherein all of the steps are performed in one press and the steps are performed sequentially.

5,813,272
APPARATUS FOR FULL ENCLOSED DIE FORGING

Kazuhiko Gomi, Hirakata, Japan, assignor to Kabushiki Kaisha Sakamura Kikai Seisakusho, Osaka, Japan

Filed May 9, 1997, Ser. No. 854,100
Claims priority, application Japan, May 9, 1996, 8-140784
Int. Cl.[6] B21J *13/02*
U.S. Cl. 72—354.8 **8 Claims**



1. An apparatus for full enclosed die forging provided with a pair of dies, a stationary die in a die housing and a movable die movable toward and away from said stationary die in a forging direction, and at least one punch to plunge into a work in the closed pair of dies, the apparatus comprising:

the stationary die being mounted in the die housing to move in said forging direction into an inside of the die housing as the closed pair of dies move in said forging direction into the inside of the die housing;

annular engaging element in the die housing surrounding an area said stationary die is placed and being movable in said forging direction and shrinkable toward said area;

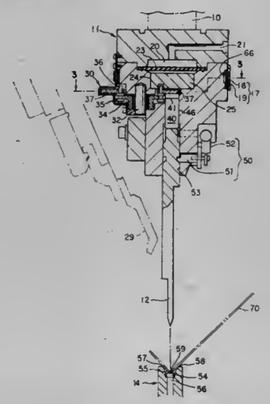
thrusting means for thrusting said annular engaging element in the forging direction into the inside of the die housing as the closed pair of dies move in said forging direction into the die housing; and

shrinking means for shrinking said annular engaging element toward and into engagement with both of said closed pair of dies during an initial portion of said annular engaging element travel into the die housing and to maintain engagement of said annular engaging element with both of the closed dies without shrinking during a subsequent portion of travel into the die housing, the shrinking means and the annular engaging element move relative to each other during the initial and subsequent portions of travel into the die housing.

5,813,273
PRESS BRAKE

Toshio Hongo, Ichikawa, Japan, assignor to Maru Kikai Kogya Co., Ltd., Tokyo, Japan

Filed May 30, 1997, Ser. No. 806,182
Claims priority, application Japan, Nov. 12, 1996, 8-314114
Int. Cl.[6] B21D *5/02*
U.S. Cl. 72—389.4 **11 Claims**



1. A press brake for bending a work sheet comprising:

a ram (**10**), an upper tool holder (**11**) mounted on a bottom end of the ram, a hydraulic cushion (**20**) formed by a hydraulic chamber (**21**) and a diaphragm (**23**) closing the bottom of said chamber, extending along the length of the upper tool holder, a press block (**25**) mounted below and adjacent said hydraulic cushion, an upper tool (**12**) mounted on a lower portion of the upper tool holder, a bed (**13**) and a lower tool (**14**) having spaced shoulders (**57**, **58**) and a height adjustable lower tool bottom member (**54**);

the upper tool holder including:

a plurality of pressure transmission pins (**40***a* **40***b*,**40**) symmetrically mounted on either side of a mechanical center line (**80**) between the press block and the upper tool, at least one of said pins **40***a* and **40***b* on each side of said center line being base pins, and the rest of the pins (**40**) outboard of said base pins being shorter than said base pins;

a clearance (**48**) formed between a lower surface of the press block and an upper surface of said shorter pressure transmission pins,

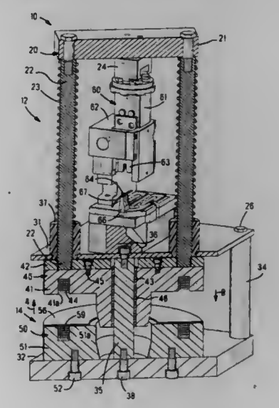
a series of spacers (**37**) carried by a spacer chain (**35**) for insertion into the clearance, and

spacer chain moving means (**30**) capable of orderly inserting a predetermined number of spacers in the clearance above the upper surface of predetermined numbers of said shorter pressure transmission pins **40** at a selected position from the mechanical center line for making an effective length of the upper tool correspond with the bending length of the work sheet.

5,813,274
MAGNETIC PRESS

Michael David Strong, Mechanicsburg, and Michael Anthony Yeomans, Camp Hill, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 20, 1996, Ser. No. 717,373
Int. Cl.[6] B21J *15/24*
U.S. Cl. 72—430 **23 Claims**



1. A press for performing a manufacturing operation, comprising an operating section having a movable plate and a tooling section with a ram movable by said movable plate in power and return strokes over an anvil, and a force generating section connected to said operating section for supplying forces to perform the manufacturing operation, said press further comprising:

(a) said force generating section comprises a first set of force generating members, said first set of force generating members comprise first and second electromagnets having separate electrical windings which are part of a press control circuit, said first electromagnet is connected to said operating section and said second electromagnet is fixed with respect to said anvil for supplying forces to said tooling section during activation of said press control circuit;

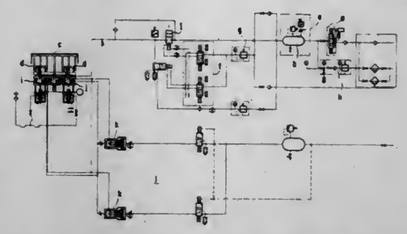
(b) said operating section comprises a second set of force generating members; and

(c) said tooling comprises a feed mechanism interface, said first and second sets of force generating members provide sufficient force to the tooling to drive the power and return strokes of the ram and to drive the feed mechanism interface.

5,813,275
SAFETY CIRCUIT FOR PRESS DIE CUSHION

Yasuo Kawakami, and Masami Suzuki, both of Komatsu, Japan, assignors to Komatsu Ltd., Tokyo, Japan

PCT No. PCT/JP95/01336, § 371 Date Dec. 17, 1996, § 102(e) Date Dec. 17, 1996, PCT Pub. No. WO96/01159, PCT Pub. Date Jan. 18, 1996
PCT Filed Jul. 4, 1995, Ser. No. 765,386
Claims priority, application Japan, Jul. 5, 1994, 6-153396
Int. Cl.[6] B21D *24/08*
U.S. Cl. 72—453.13 **9 Claims**



1. A safety circuit for a press die cushion, said press die cushion having a pad that is resiliently supported by a cushion cylinder which is supplied with a pilot pressure via an air delivery circuit, and said press die cushion having a locking circuit for locking the pad, said safety circuit comprising:

a first electromagnetic valve which is electrically switchable in two directions for controlling delivery of the pilot pressure to an air supply valve in the air delivery circuit to the cushion cylinder, and for controlling the air supply valve in order to lift the pad up and down;

an on and off valve disposed in a pilot pressure delivery passage of the air delivery circuit, said on and off valve being opened when the pad lies in a vicinity of a lower limit position;

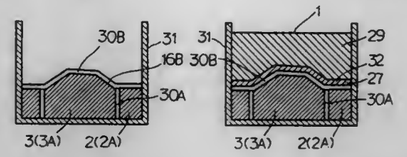
a second electromagnetic valve connected to the on and off valve, said second electromagnetic valve being electrically switchable in a first direction to a blocking position when a power supply is turned on, and said electromagnetic valve being mechanically switchable thereafter to a communicating position when the power supply is turned off; and

an exhaust valve provided in the air delivery circuit, said exhaust valve being switched into an exhaust position when the pilot pressure is applied via the on and off valve and the second electromagnetic valve, and said exhaust valve being switched into a blocking position when the pilot pressure is absent.

5,813,276
PRESS DIE OF CEMENT COMPOSITE AND A METHOD OF PRODUCING THE SAME

Naomi Maeda, 6-4, Kamihoncho, Sakata-shi, Yamagata 988, Japan

Filed Jan. 31, 1997, Ser. No. 797,657
Claims priority, application Japan, Jul. 13, 1995, 7-2000438
Int. Cl.[6] B21D *37/01*
U.S. Cl. 72—462 **12 Claims**



1. A press die formed of a cement composite, comprising a punch and a blank holder, each being formed from respective cut

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portions of a single punch and blank holder forming member, said single punch and blank holder forming member having a two layer construction including a surface layer of cement composite having excellent transfer properties and a layer of cement composite of high strength integrally formed with the surface layer.

5,813,277

APPARATUS AND METHOD FOR MEASURING THE TENSILE STRENGTH OF FABRIC

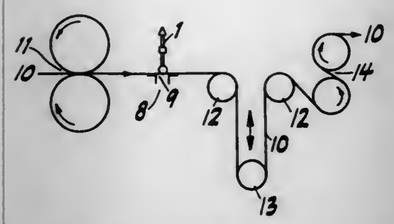
Klaus Schmidt, Kaiserslautern, and Peter Schmitt, Rodenbach, both of Germany, assignors to Firma Carl Freudenberg, Germany

Filed Jul. 25, 1995, Ser. No. 506,459

Claims priority, application Germany, Jul. 26, 1994, 44 26 405.4

Int. Cl.[6] G01N *3/30*

U.S. Cl. 73—159 **4 Claims**



1. An apparatus for determining the tensile strength of a textile fabric, comprising:

a stationary electromagnet that can be selectively energized, said electromagnet having a downwardly opening cavity that is conical in shape, said conical cavity having a height of approximately 50 mm;

an impact assembly comprising

a magnetically attractable mass having a weight of approximately 180 to 250 grams that corresponds in shape to the conical cavity of the electromagnet so as to fit into that cavity, said mass having an axial length of at least approximately 47 mm;

a piezoelectric force sensor that provides an electrostatic charge signal in dependence upon the degree to which it is mechanically loaded;

a first vertically extending rigid **19** connecting member no more than 40 mm in length, said connecting member being coaxial with the magnetically attractable mass, said first connecting member being rigidly connected to the mass at a first end and to the force sensor at its other end;

an impact body and a second rigid connecting member coaxial with the first connecting member joining the force sensor to the impact body, said second connecting member being no more than 40 mm in length, wherein the impact body is made of a non-elastic and non-plastic material making up at most half the mass of the impact assembly, the portion of the impact body facing away from the force sensor having a conical or spherical rounding having a radius of curvature of approximately from 0.5 mm to 25 mm;

a gripping apparatus for holding the surface of the textile fabric that is to be measured with a consistent tension in a horizontal orientation approximately 10 mm beneath the impact body, said gripping apparatus comprising:

elongated guide elements running parallel to one another located on both sides of the fabric over which the impact assembly is situated;

a measuring table located between the guide elements and beneath the impact body, said measuring table supporting the textile fabric in a horizontal configuration and having a 20 mm wide gap beneath the impact body;

wherein the sensor provides a signal representative of the force with which the impact body strikes the textile fabric when the electromagnet is de-energized, from which the underlying tensile strength of the fabric can be determined by means of a linear regression calculation.

5,813,278

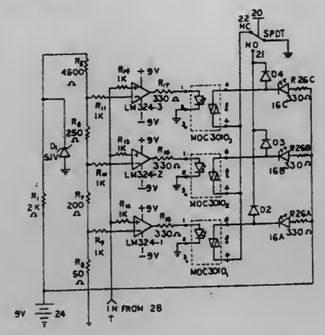
PROJECTILE GRENADE LAUNCHING SYSTEM TESTER

Paul G. Schabdach, Churchville, and Irving F. Barditch, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1996, Ser. No. 700,333

Int. Cl.[6] G01L *5/14*

U.S. Cl. 73—167 **17 Claims**



1. A projectile grenade launching system tester for testing a projectile grenade launching system, the tester comprising:

jack means for receiving an electrical voltage provided by the projectile grenade launching system for launching a grenade;

level determining means, responsive to the electrical voltage received by the jack means, for determining whether the electrical voltage is at least equal to each of a plurality of predetermined levels, the level determining means comprising a plurality of comparing means, each for comparing the electrical voltage to a corresponding one of the predetermined levels and outputting a comparison signal indicating whether the electrical voltage is at least equal to the corresponding one of the predetermined levels; and

display means, receiving the comparison signals from the plurality of comparing means, for producing a display indicative of the comparison signals.

5,813,279

SYSTEM FOR POSITIONING BORESIGHT CALIBRATION TOOLS

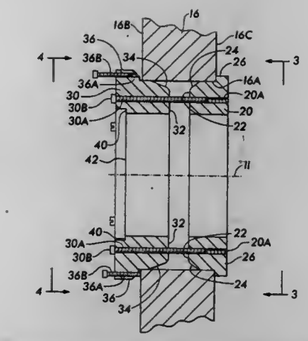
William L. Farley, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 29, 1997, Ser. No. 903,330

Int. Cl.[6] F41G *1/54*

U.S. Cl. 73—167 **13 Claims**

1. In a launch cell capable of supporting a projectile therein such that a central longitudinal axis of said launch cell is coincident with a central longitudinal axis of said projectile, said launch cell terminating at either end thereof in a door where each door is provided with a hole through which said projectile can pass wherein a center of said hole is coincident with said central longitudinal axis of said launch cell, a system for positioning a boresight calibration tool relative to said central longitudinal axis of said launch cell, said system comprising:



an open-ended first tube sized for engagement in said hole, said first tube terminating at a first end thereof in a flange wherein said first tube is inserted into said hole from a side of said door facing towards said launch cell until said flange of said first tube abuts said door;

an open-ended second tube sized for engagement in said hole, said second tube terminating at a first end thereof in a flange wherein said second tube is inserted into said hole from a side of said door facing away from said launch cell such that said flange of said second tube is adjacent said door, and wherein said first tube and said second tube are spaced apart from one another within said hole;

said second tube including means for supporting a boresight calibration tool at said first end thereof;

means for coupling said first tube to said second tube when said first tube and said second tube are engaged in said hole; and

means cooperating between said flange of said second tube and said door for adjusting spacing therebetween.

5,813,280

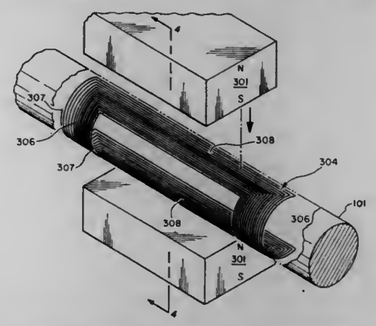
ACOUSTIC RESONATOR FOR MEASURING FORCE

Ward L. Johnson, Louisville; George A. Alers, Boulder, both of Colo., and Bert A. Auld, Portola Valley, Calif., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Sep. 4, 1996, Ser. No. 708,393

Int. Cl.[6] G01L *7/10*

U.S. Cl. 73—643 **28 Claims**



1. An acoustic resonator for measuring force comprising:

a cylindrical body having:

a central section with a first radius (a) comprising a material having a plane-wave shear velocity v_a; and

two distal sections with a second radius (b) comprising a material having a plane-wave shear velocity v_b, wherein the ratio a/v_a differs from the ratio b/v_b by an amount selected to trap some acoustic resonant modes in the central section.

5,813,281

DEVICE FOR REDUCING TORQUE VARIATIONS FOR USE IN DRIVE APPARATUS

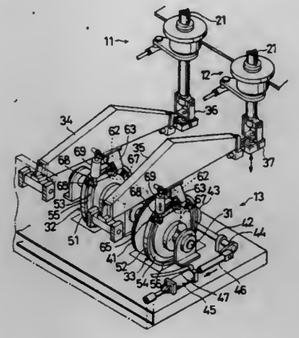
Kiyomi Yoshida; Fumiyuki Iwano, and Michio Ueda, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Nov. 30, 1995, Ser. No. 565,583

Claims priority, application Japan, Dec. 1, 1994, 6-298133; Jun. 15, 1995, 7-148989

Int. Cl.[6] F16H *21/38*

U.S. Cl. 74—36 **7 Claims**



1. In a drive apparatus having a drive shaft for causing n lift units to each perform one cycle of up-and-down movement at a specified interval by one rotation of the drive shaft, where n is an integer greater than zero, a device for reducing torque variations comprising:

elastic means for providing an elastic force; and

transmission means for transmitting the elastic force of said elastic means to the drive shaft as a rotational torque,

wherein the transmission means comprises a main gear fixed to the drive shaft, a driven gear coupled to the main gear for power transmission therebetween, a driven shaft having the driven gear fixed thereto, and an arm fixed to the driven shaft and having a forward end for the elastic force of the elastic means to act upon, and when the number of cycles of torque variations involved in one turn of rotation of the drive shaft is n, the gear ratio of the main gear to the driven gear is n:1.

5,813,282

POWERED SLIDING-DOOR SYSTEM AND ACTUATING DEVICES FOR THE SAME

Chiharu Azuma, Hyogo-ken, Japan, assignor to Nippon Cable System Inc., Hyogo-ken, Japan

Division of Ser. No. 587,743, Jan. 19, 1996. This application Apr. 7, 1997, Ser. No. 834,978

Claims priority, application Japan, Feb. 28, 1995, 7-66879; Feb. 28, 1995, 7-66880

Int. Cl.[6] F16H *27/02*

U.S. Cl. 74—89.22 **4 Claims**

1. A cable actuator for an automatic door closer, the actuator comprising:

(a) a first cable for operating a close lever;

(b) a first pulley for winding the first cable;

(c) a second cable for operating an open lever;

(d) a second pulley for winding the second cable;

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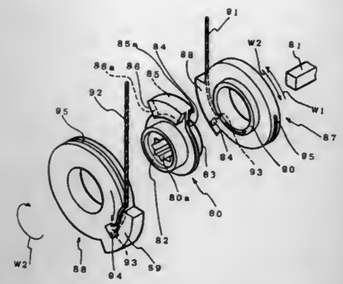


(e) a middle drum which engages with the first pulley but does not engage with the second pulley to wind up the first cable but not the second cable when the middle drum rotates in a first direction, and which engages with the second pulley but does not engage with the first pulley to wind up the second cable but not the first cable when the middle drum rotates in a second direction; and

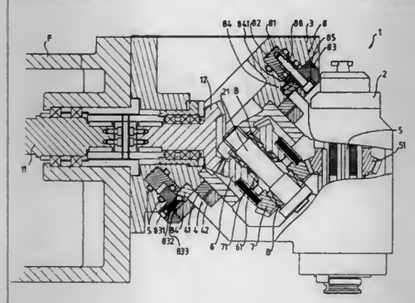
(f) a means for rotating the middle drum in both directions selectively.

5,813,283

VERTICAL/HORIZONTAL SPINDLE HEAD FOR MACHINE TOOLS

Lei-Yi Chen, Chutung; Shao-Yu Hsu, Hsinchu, and Jinn-Fa Wu, Baoshan, all of Taiwan, assignors to Industrial Technology Research Institute, Chutung, Taiwan

Filed Jun. 20, 1996, Ser. No. 666,929
Int. Cl.[6] F16H *1/14*
U.S. Cl. 74—417 **4 Claims**



1. A vertical/horizontal spindle head for machine tools comprising:

a main transmission shaft pivotally arranged on a body of a machine tool and having two ends, one end being co-axially secured to a first bevel gear thereon;

a lower rotatable housing including a main shaft, said main shaft being circumferentially and coaxially secured with a second bevel gear;

a bevel gear axle firmly secured within said lower rotatable housing and forming angles respectively with said main transmission shaft and said main shaft;

a third bevel gear and a fourth bevel gear coaxially arranged on said bevel gear axle to be rotated together and being biased by a plurality of compressed springs therebetween so that said third bevel gear can axially slide on said bevel gear axle, while maintaining an engagement of the third bevel gear with the first bevel gear;

an upper seat secured on the body of the machine tool concentrically with the bevel gear axle;

a push/pull apparatus for pushing/pulling the lower rotatable housing to move in an axial direction of the bevel gear axle between a first position where the lower rotatable housing is closest to the upper seat and a second position where the lower rotatable housing is furthest from the upper seat, said push/pull apparatus being concentric with the bevel gear axle and arranged on the upper seat;

a curved coupling including an upper curved ring and a lower curved ring respectively positioned on said upper seat and said lower rotatable housing, said upper and lower curved rings being coupled and uncoupled in said first and second positions respectively;

a slidable spline device disposed between said third bevel gear and said bevel gear axle, said slidable spline device being disengaged and engaged when the lower rotatable housing is respectively in the first and second positions;

wherein said push/pull apparatus for pushing/pulling the lower housing comprises a hydraulic device comprising:

an annular hydraulic cylinder concentric with the bevel gear axle and formed on said upper seat;

an annular piston movably arranged within said annular hydraulic cylinder;

an upper gland ring secured at an opening of said hydraulic cylinder;

a lower gland ring concentrically arranged with the bevel gear axle;

a supporting ring disposed between said upper and lower gland rings; and

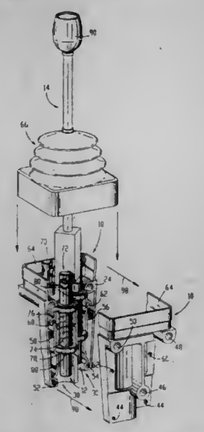
a plurality of supporting bolts having two ends, one end being secured to said lower gland ring and the other end being secured to said piston for mechanically connecting the lower rotatable housing to the piston.

5,813,284

REMOTE VALVE CONTROL APPARATUS

Marvin L. Cox, Wichita, Kans., assignor to Wescon Products Company, Wichita, Kans.

Filed Mar. 26, 1996, Ser. No. 621,658
Int. Cl.[6] G05G *9/047*
U.S. Cl. 74—471 XY **9 Claims**



7. A housing for a remote valve control apparatus, wherein the apparatus is adapted for use in supporting a pair of linear actuators for linear movement between actuated and non-actuated positions, and a lever having an upper end adapted for manipulation and a lower end connected to each of the actuators for relative universal pivotal movement, the lever being supported on the housing for universal pivotal movement relative to the housing so that upon manipulation of the upper end of the lever, the lever pivots relative to the housing and the actuators, shifting the actuators between the non-actuated and actuated positions, the housing comprising:

a pair of molded housing elements each forming one half of the housing, the housing elements being exactly identical to one another such that a single mold shape can be used to form both elements,

each housing element including an inside surface defining a central longitudinal axis, an outside surface, and an upper end surface,

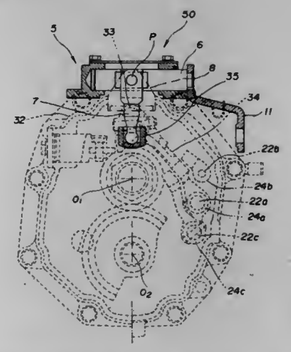
the inside surface presenting a pair of axially extending cavity halves extending parallel to one another and being spaced on opposite sides of the central longitudinal axis by an equal distance so that when the two elements are assembled, the cavity halves align to define a pair of cavities adapted to receive the actuators.

5,813,285

MANUAL TRANSMISSION WITH REMOTE CONTROLLER MECHANISM

Tsutomu Niimi, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 16, 1996, Ser. No. 733,107
Claims priority, application Japan, Oct. 16, 1995, 7-267126
Int. Cl.[6] F16H *3/00;59/04*
U.S. Cl. 74—473.3 **5 Claims**



1. A manual transmission remotely controlled by a speed change lever, said transmission comprising:

a transmission casing;

a plurality of parallel fork shafts which extend in said casing;

a striking rod which extends within said casing, in parallel with said fork shafts, said striking rod being pivotal about an axis thereof to engage a selected one of said fork shafts, and slidable along said axis to axially move the selected fork shaft to a desired position which engages a corresponding coupling sleeve with a desired gear;

an input block connected to said striking rod to move therewith; and

a remote controller mechanism which transmits select and shift operations of said speed change lever to said input block the remote controller mechanism including:

a box detachably connected to the transmission casing;

an inner change lever movably mounted in the box, the inner change lever having one end pivotally connected with the input block;

a first structure for pivoting the inner chance lever about a first pivot center in a first direction to cause a pivoting movement of the striking rod about the axis thereof when the shift operation is carried out by the speed change lever; and

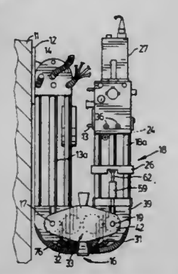
a second structure for pivoting the inner change lever about a second pivot center in a second direction to cause a sliding movement of the striking rod along the axis thereof when the shift operation is carried out by the speed change lever, wherein the first and second directions are perpendicular to each other, and the first and second pivot centers are the same.

5,813,286

SUPPORT ARM

Henning Hansen, 1470 Highbush Trail, Pickering, Canada, L1V 1N5

Filed Apr. 4, 1996, Ser. No. 628,243
Int. Cl.[6] B25J *11/00;17/00*
U.S. Cl. 74—490.02 **7 Claims**



1. A support arm comprising stationary support structure, a boom, a knuckle and an auxiliary jib section, said boom connected at one end to the support structure and at an opposite end to one end of the knuckle, and an opposite end of the knuckle to one end of the auxiliary jib section each through pivotal connections for pivoting about respective vertical pivot axes, an opposite end of the auxiliary jib section being connected to a main jib section through a pivotal connection for pivoting about a horizontal axis, first and second flexible tubes connecting across the knuckle and the auxiliary jib section between the boom and the main jib section, and wherein the flexible tubes extend from points on the main jib section in parallel horizontally spaced relationship and passing slippingly and in parallel longitudinally through parallel horizontally spaced guide sleeves connected on the auxiliary jib section and in the region of the knuckle converging and crossing one over the other in loosely curved configuration toward horizontally spaced points on said opposite end of the boom, and means for adjusting the elevation of the main jib section by pivoting it about said horizontal pivot axis, between an upper position parallel to the boom and a lower position inclined downwardly thereto.

5,813,287

COORDINATE POSITIONING MACHINE

David R. McMurtry, and Nicholas A. James, both of Wotton-Under-Edge, United Kingdom, assignors to Renishaw PLC, Gloucestershire, United Kingdom

Continuation-in-part of Ser. No. 396,721, Mar. 1, 1995, abandoned. This application Jul. 22, 1996, Ser. No. 685,097
Claims priority, application United Kingdom, Mar. 2, 1994, 9403957; Sep. 15, 1994, 9418587; Dec. 21, 1994, 9425887
Int. Cl.[6] B25J *9/14;11/00*
U.S. Cl. 74—490.06 **18 Claims**

18. A coordinate positioning machine having:

a fixed structure;

a moveable structure which is movable relative to the fixed structure with three linear degrees of freedom;

a passive anti-rotation device for eliminating at least two rotational degrees of freedom of the moveable structure; and

three powered extensible and retractable elongate struts, each being extensible and retractable to increase or decrease a length of the corresponding strut extending between the moveable structure and the fixed structure, each of the struts

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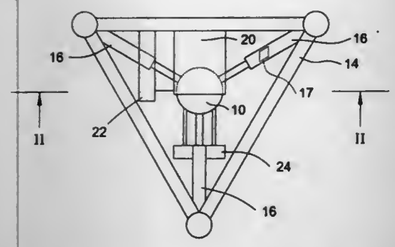


being universally pivotally connected to the moveable structure and the fixed structure, whereby a change in strut length between the moveable structure and the fixed structure of at least one of the struts causes translation of the moveable structure relative to the fixed structure.

5,813,288

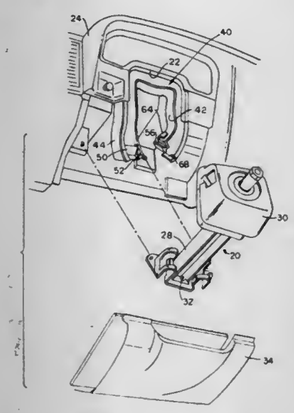
STEERING COLUMN CLOSE-OUT BOOT

Vincent J. Simonetti, Ferndale, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 8, 1996, Ser. No. 694,122

Int. Cl.[6] B62D *1/18;* **B61F** *15/22*

U.S. Cl. 74—492 **10 Claims**



1. A close-out boot for use in conjunction with a steering column of a motor vehicle, the boot being adapted to seal around an annular flange of a housing carried by the steering column,

said boot being made of a flexible elastomeric material,

said boot being in the form of an annulus with a transverse split, and U-shaped in cross-section to provide an annular radially inner wall having ends abutting at the split and an annular radially outer wall having ends abutting at the split,

said radially inner wall being adapted to engage and seal around said annular flange of said housing,

said ends of said inner wall having complementary coupling parts adapted to be releasably connected together, and

said radially outer wall being adapted to be secured to vehicle support structure.

5,813,289

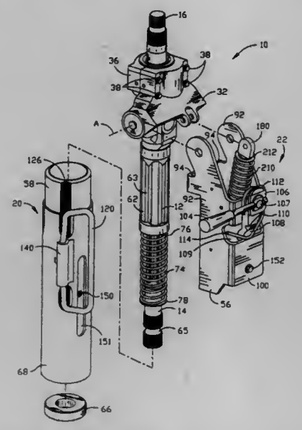
STEERING COLUMN

Chester D. Renick, Lafayette; Albert E. Becker, Jr., West Lafayette, and James M. Hobaugh, II, Lafayette, all of Ind., assignors to TRW Inc., Lyndburst, Ohio

Continuation of Ser. No. 649,894, May 14, 1996, abandoned. This application Sep. 29, 1997, Ser. No. 939,863

Int. Cl.[6] B62D *1/18;* **G05G** *5/16;5/18*

U.S. Cl. 74—493 **30 Claims**



18. A steering column comprising:

first and second steering column members, said first steering column member being axially movable relative to said second steering column member;

a member connected to said first steering column member and movable with said first steering column member relative to said second steering column member, said member including a plurality of teeth;

support means for connecting said steering column to a vehicle frame; and

a telescope locking member including a plurality of teeth for engaging said plurality of teeth on said member connected to said first steering column member, said telescope locking member having a first position in which said plurality of teeth on said telescope locking member engage said plurality of teeth on said member connected to said first steering column member to prevent movement of said first steering column member relative to said second steering column member and a second position in which said plurality of teeth on said telescope locking member are spaced from said plurality of teeth on said member connected to said first steering column member to permit axial movement of said first steering column member relative to said second steering column member.

5,813,290

AUTOMATIC TENSION CONTROLLING MECHANISM OF CONTROL CABLE

Shigemasa Takahashi; Mitsunari Kato, both of Nagano, and Yoshiharu Kitamura, Kanagawa, all of Japan, assignors to UNI Flex Inc., Nagano, and NHK Spring Co., Ltd., Kanagawa, both of Japan

Continuation of Ser. No. 351,030, Dec. 7, 1994, abandoned. This application Apr. 2, 1997, Ser. No. 832,476

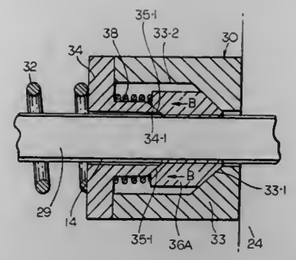
Claims priority, application Japan, Dec. 9, 1993, 5-065820

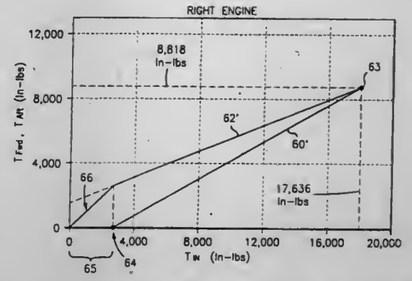
Int. Cl.[6] F16C *1/10*

U.S. Cl. 74—501.5 R **1 Claim**

1. An automatic tension controlling mechanism comprising:

a control cable





a tension controlling mechanism through which a threaded rod of the control cable passes

a first spring provided between a lock nut meshed with a tip end of said threaded rod and said tension controlling mechanism to press resiliently said tension controlling mechanism, where said first spring automatically absorbs a foreseeable slack of the control cable and maintains the cable in a desired state of tension, wherein said tension controlling mechanism comprises:

a case through which threaded rod passes;

a split threaded ring which is stored in said case and capable of being meshed with said threaded rod;

a second spring stored in said case for pressing the split threaded ring in a direction which is parallel to an outer surface of threaded rod; and

a tapered face formed in said case, which opposes a resilient force produced by said second spring and urges said split threaded ring in the direction of meshing with said threaded rod by means of the resilient force of said second spring;

wherein the case is provided with a lid having an opening to let the threaded rod to pass therethrough, where the lid has a male tapered end face and the split thread ring has a female tapered end face to mesh with the male tapered end face of the lid.

5,813,291

Patent Not Issued For This Number

5,813,292

METHOD FOR FABRICATING A SPLIT PATH TRANSMISSION SYSTEM PROVIDING EQUAL TORQUE SPLITTING BETWEEN THE SPLIT LOAD PATHS OF EACH GEAR TRAIN THEREOF AT A PREDEFINED OPERATING POINT

Jules G. Kish, Milford; Robert J. Durwin, Trumbull, and Timothy L. Krantz, North Olmsted, all of Conn., assignors to Sikorsky Aircraft Corporation, Stratford, Conn.

Filed Dec. 15, 1995, Ser. No. 573,161

Int. Cl.[6] F16H *3/095*

U.S. Cl. 74—665 C **5 Claims**

1. A method of fabricating a split pat mission system including at least one gear train having forward and aft split load paths, comprising the steps of:

(a) identifying torque distribution curves of the forward and aft split load paths of the at least one gear train of the split path transmission system either empirically or analytically;

(b) depicting the forward and aft torque distribution curves of step (a) in a graphical format wherein an abscissa of the graph represents torque input Tin coupled into the at least one gear train and an ordinate of the graph represents torque transmitted through the forward and aft split load paths, respectively;

(c) selecting a predefined operating point for the split path transmission system wherein equal torque splitting between the forward and aft split load paths of the at least one gear train is desired;

(d) analytically modifying the forward and aft torque distribution curves as required to pass through the predefined operating point;

(e) identifying an interception point of the abscissa with the analytically-modified forward or aft torque distribution curve having the steeper slope to quantify an input torque range; and

(f) altering a timing relationship of the gears and pinions of the split load path represented by the analytically-modified torque distribution curve having the steeper slope to provide an intentional timing difference between the gears and pinions of the forward and aft split load paths, respectively, wherein during operation of the split path transmission system the other split load path transmits all torque input Tin to an output shaft over the input torque range.

5,813,293

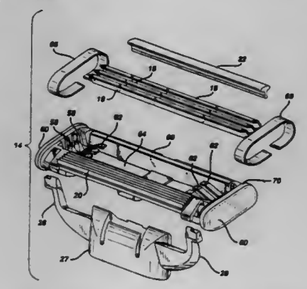
SHAVING SYSTEM AND METHOD

Domenic Vincent Apprille, Jr., Arlington; Donald Robert Chaulk, Needham; Joseph George Fucci, Hanson; Stephen Cabot Metcalf, West Newton; Robert Anthony Trotta, Pembroke, and Charles Bridgham Worrick, III, Hanson, all of Mass., assignors to The Gillette Company, Boston, Mass.

Division of Ser. No. 630,437, Apr. 10, 1996, Pat. No. 5,787,586. This application Aug. 22, 1997, Ser. No. 918,601

Int. Cl.[6] B26B *21/14*

U.S. Cl. 76—106 **15 Claims**



1. A method of making a replaceable shaving cartridge comprising

providing a housing for carrying one or more blades and an interconnect member having a pivotal support structure and a base structure adapted to be removably and fixedly attached to a handle,

inserting said pivotal support structure into a recess in said housing, and

retaining said pivotal support structure in said recess.

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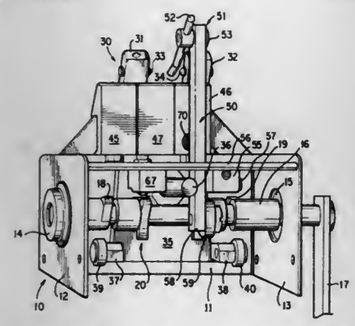
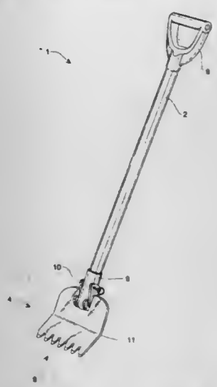
5,813,294
SAW BLADE TEETH SETTING APPARATUS
Ben Maxwell Hutchinson, 13 Industrial Ave., Caloundra, Queensland, 4551, Australia
Filed Sep. 4, 1996, Ser. No. 706,284
Claims priority, application Australia, Sep. 8, 1995, 30508/95
Int. Cl.[6] B23D *63/02*
U.S. Cl. 76—63 **13 Claims**



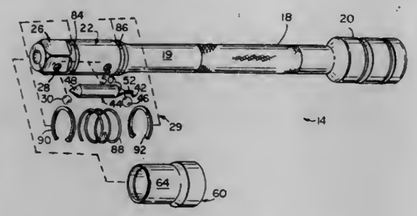
1. An apparatus for setting teeth of a blade, the apparatus including:
a body,
a control shaft extending across said body,
a first pair of cams and a second pair of cams mounted on said control shaft,
a pair of blade clamping blocks mounted on said body for relative movement with respect to one another,
one block of said pair of blade clamping blocks having a cavity,
a slide movable within said cavity in said one block,
a cam follower mounted to said slide,
said cam follower engaging one cam of said second pair of cams on said control shaft to move said slide within said cavity to thereby clamp the blade within the apparatus.

5,813,295
ROOFING MATERIAL REMOVAL TOOL
Emery W. Jensen, Jr., North 2863 County Hwy. "E", Merrill, Wis. 54452
Filed Feb. 26, 1996, Ser. No. 606,921
Int. Cl.[6] E04D *15/00*
U.S. Cl. 81—45 **6 Claims**



1. A roofing material removal tool comprising:
an elongated handle;
a head;
said handle including a first end terminated by a collar, and a second end;
a pivot pin affixed to and aligned along the axial center of said collar and protruding outward from said collar;
a receiving hole formed by and penetrating said collar at a point along said collar spaced apart from said pivot pin and offset from the axial centerline of said collar and handle; and
position locking means for being received by and penetrating said receiving hole.

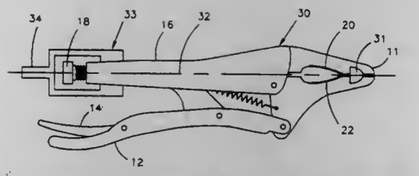
5,813,296
QUICK RELEASE SOCKET MECHANISM
Jeffrey H. Hoff, Kenosha; Frank Mikic, deceased, late of Lake Geneva, and Mark Eberhage, legal representative, Greenfield, all of Wis., assignors to Snap-On Technologies, Inc., Lincolnshire, Ill.
Filed Sep. 26, 1996, Ser. No. 721,227
Int. Cl.[6] B25B *23/16*
U.S. Cl. 81—177.85 **13 Claims**



1. A socket drive tool for use with a socket, the drive tool comprising:
an elongated shaft having a coupling structure for coupling to a socket;
the coupling structure including a detent recess and a detent member disposed in the detent recess and moveable between retaining and releasing positions relative to the socket;
the shaft having a cavity therein communicating with the detent recess;
a tubular sleeve disposed about the shaft and having a sleeve cam surface, the tubular sleeve being moveable between a retaining condition and a releasing condition; and
a linking structure disposed in and moveable within the cavity and having a first cam surface engageable with the detent member and a second cam surface engageable with the sleeve cam surface, wherein when the tubular sleeve is in the retaining condition, the sleeve cam surface causes the linking structure to hold the detent member in its retaining condition, and wherein when the tubular sleeve is in the releasing condition it causes the linking structure to permit movement of the detent member to its releasing position.

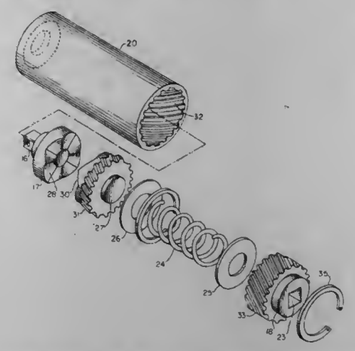
5,813,297
SCREW DRIVING TOOL
John Zepkowski, R.D. 2, Canton, Pa. 17724
Filed Feb. 11, 1997, Ser. No. 799,390
Int. Cl.[6] B25B *7/02*
U.S. Cl. 81—426.5 **1 Claim**

1. A method of inserting a screw into the surface of a workpiece, said screw having a slot in an end thereof, said method comprising
inserting said screw between the jaws of a tool that includes first and second cooperating jaws connected by a pivot, each jaw including a gripping surface and two side surfaces, each jaw having a nose end that is remote from said pivot,
handle means connected to said jaws for causing said jaws to close about said pivot,



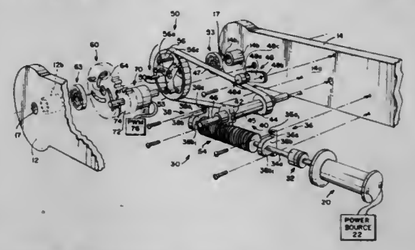
a longitudinal axis extending in a plane that lies substantially along the region of jaw surface contact when the jaws are closed, said axis lying midway between the two side surfaces of each jaw,
a groove in the gripping surface of at least one of said jaws, said groove lying along said longitudinal axis and extending to the nose end of said jaw,
a cavity formed in both of said jaws at the end of said groove opposite said nose, said cavity being deeper than said groove, and
a blade-like protrusion in the cavity of at least one of said jaws, the step of inserting said screw including
inserting said screw between said jaws including inserting said blade-like protrusion into the slot in the head of said screw while inserting the shank of said screw between said jaws so that said shank lies within said groove with the head of said screw extending into said cavity,
advancing said tool toward said workpiece to pierce the surface of said workpiece by the tip of said screw, and
rotating said tool to cause said screw to advance into said workpiece.

5,813,298
HAND TOOL TORQUE SOCKET
Robert L. Beattie, 1730 Moreno Dr., Simi Valley, Calif. 93063
Filed Dec. 23, 1996, Ser. No. 772,757
Int. Cl.[6] B25B *23/157*
U.S. Cl. 81—475 **7 Claims**



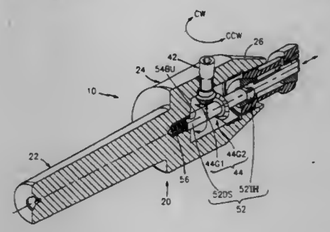
1. A torque device for interfacing between a turning tool and a fastener comprising:
a cylindrical housing having open opposite ends;
a drive plate disposed in said housing adjacent one open end;
a driven plate disposed in said housing adjacent the other said open end;
means operably connected between said drive plate and said driven plate to adjustably apply a regulated torque to said driven plate in response to movement of said drive plate
said means for adjustably applying a regulated torque comprise:
a spring plate bearing against said driven plate;
resilient means carried in said housing expanding against said drive plate and said spring plate and wherein said resilient means include a pre-selected spring rate;
said housing having a central bore with spiral ridges carried thereon; and
each of said drive plate and said spring plate having gear teeth in mesh with said housing spiral ridges whereby rotation of said drive plate causes said driven plate to rotate via said spring plate.

5,813,299
AUTOMATIC FEED ROTARY TUBING CUTTER FOR FUEL ROD TUBING OF A NUCLEAR FUEL ASSEMBLY
Richard N. Soucy, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.
Filed Jul. 23, 1996, Ser. No. 685,833
Int. Cl.[6] B23B *5/14*
U.S. Cl. 82—61 **12 Claims**



1. A rotary tubing cutter, comprising:
a first rotatable gear pivotally supporting a plurality of concentric cutting blades;
a plurality of cam pins, one each being attached to said plurality of cutting blades, respectively;
a second rotatable gear disposed substantially coaxially with said first gear, said second gear having cam slots therein and being configured to control a cutting position of said cutting blades, wherein said cam pins engage said cam slots, respectively; and
a motor coupled to said first gear and said second gear.

5,813,300
PRECISION CENTER WITH AN INTERCHANGEABLE DOUBLE-ARCUATE FLOATING COLLET
Edward H. Bittner, Madison, Conn., assignor to Sikorsky Aircraft Corportion, Stratford, Conn.
Filed Mar. 27, 1997, Ser. No. 828,019
Int. Cl.[6] B23B *31/40*
U.S. Cl. 82—150 **18 Claims**



13. A double-arcuate floating collet for use in combination with a precision center to mount a workpiece for one or more precision machining operations, comprising:
a body member having a design configuration that includes a first expansion collar having an arcuate configuration, a second expansion collar having an arcuate configuration, and a

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slotted cylinder intermediate and contiguous with said first and second expansion collars; and

reconfiguration means disposed in combination with said body member and operative in response to a drive force for alternatively reconfiguring said body member between a contracted condition and an expanded condition,

wherein said first and second expansion collars are radially expanded to mechanically engage said precision center and the workpiece respectively, in the expanded condition for one or more precision machining operations and wherein said first and second expansion collars are radially contracted to mechanically disengage from the precision center and the workpiece, respectively, in the contracted condition for removal of said double-arcuate floating collet from combination with the precision center and the workpiece.

5,813,301

PUNCHING TOOL

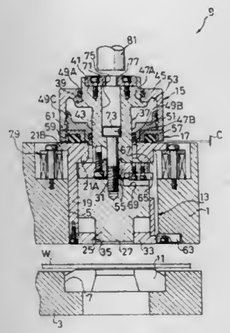
Oriya Fujita, Kanagawa-ken, Japan, assignor to Amada Metrecs Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 443,423, May 18, 1995, abandoned, which is a continuation-in-part of Ser. No. 189,604, Feb. 1, 1994, Pat. No. 5,445,057. This application Apr. 9, 1997, Ser. No. 833,772

Claims priority, application Japan, Feb. 3, 1993, 5-16188; May 27, 1994, 6-115083

Int. Cl.[6] B26F *1/14;* **B21D** *45/08;* **F16F** *9/02*

U.S. Cl. 83—140 **6 Claims**



1. A punching tool for a press, comprising:

a punch guide;

a punch body formed with a blade portion at a lower end thereof and movably disposed within said punch guide for up and down movement, and means for movably supporting the punch guide, wherein said punch guide is movable with said punch body and movable with respect to said punch body;

a punch driver having a piston rod portion, said punch driver being fixed to said punch body;

a gas spring section having a gas cylinder, the piston rod portion of said punch driver extending through the gas cylinder for up and down movement, and a high pressure gas being contained in the gas cylinder to bias said piston rod portion, and thereby said punch body and said punch driver, in an upward direction; and

an elastic member interposed between an upper surface of said punch guide and a lower surface of the gas cylinder of said gas spring section to absorb shock generated when a work is punched out by the punching tool.

5,813,302

SAWING APPARATUS

Åke Haglund, 1504-110 W. 4th Street, N. Vancouver B.C., Canada, V7M 3H3

Division of Ser. No. 167,935, Dec. 21, 1993, abandoned. This application Sep. 6, 1996, Ser. No. 709,154

Claims priority, application Sweden, Jun. 24, 1991, 9101916

Int. Cl.[6] B26D *7/06*

U.S. Cl. 83—156 **8 Claims**

1. An apparatus for sawing timber, comprising: a stand (**1**), a first sawing means (**3**) and feed means (**4,41**) for supporting timber pieces to be cut and which is movable to and from in relation to said stand so as to forward said timber pieces past said first sawing means; a section (**45**) of said feed means (**4,41**) being relatively narrow and being disposed to move to and from in a gap between said first sawing means (**3**) and at least one second sawing means (**7**); a transporter (**9**) for said timber pieces of predetermined width disposed to the side of and along the direction of movement of said feed means (**4,41**), and said at least one second sawing means (**7**) being adjustable within at least a part of said predetermined width of said transporter (**9**); and additional sawing means (**25**) arranged to cut said timber pieces moving along said transporter (**9**); and said additional sawing means (**25**) arranged in an active position when positioned for cutting said timber pieces moving along said transporter (**9**), and in an inactive position when disposed out of the way of said timber pieces moving along said transport (**9**); a pressing member (**36**), and an adjustable side stock (**30**) for said timber pieces moving in said apparatus, and said adjustable side stock being movable over at least part of said predetermined width of said transporter (**9**), and said pressing member urging said timber piece against said adjustable side stock; whereby said apparatus enables an operator thereof to saw a timber piece in a variety of different ways.

5,813,303

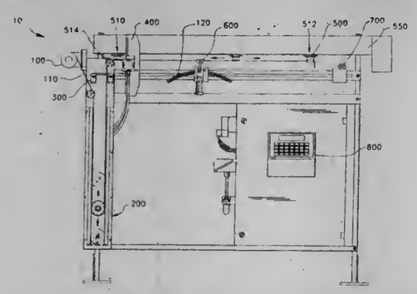
APPARATUS FOR CUTTING A SURGICAL SUTURE AT TWO LOCATIONS

Bernd Haase, Berkeley Heights, N.J.; John J. Price, Gainesville, Ga., and Kenneth J. Smith, Somerville, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed May 10, 1996, Ser. No. 644,871

Int. Cl.[6] B26D *1/00*

U.S. Cl. 83—170 **12 Claims**



1. An apparatus for cutting a surgical suture at first and second different locations along a length of said surgical suture said apparatus comprising:

(A) a first cutting die having a first face with a first channel for receiving at least a first portion of a cross-section of said surgical suture;

(B) a second cutting die having a second face with a second channel for receiving at least a second portion of said cross-section of said surgical suture;

(C) a third cutting die having a third face;

(D) a fourth cutting die having a fourth face;

(E) a first cutting blade for cutting said surgical suture adjacent to said first face when said first face of said first cutting die is positioned against said third face of said third cutting die; and

(F) a second cutting blade for cutting said surgical suture adjacent to said second face when said second face of said second cutting die is positioned against said fourth face of said fourth cutting die

wherein the first cutting blade is positioned at the first location and the second cutting blade is position at the second location along the length of the surgical suture.

5,813,304

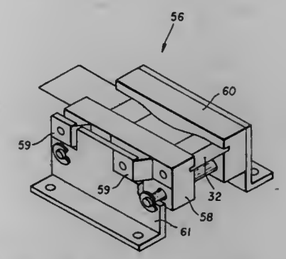
SPLICE CUTTING AND FILM RE-SHAPING APPARATUS

William Thomas Matthias, Rochester; William James Greene, Webster, and Dennis Francis Tianello, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 410,185, Mar. 24, 1995, abandoned. This application Mar. 13, 1997, Ser. No. 816,472

Int. Cl.[6] B26D *1/00*

U.S. Cl. 83—365 **15 Claims**



1. An apparatus for cutting and desplicing a roll of spliced film being drawn from a supply reel along a film path through the apparatus to form filmstrip leading and trailing ends and re-shaping each filmstrip end, the apparatus comprising:

a splice cutter located along the film path to cut the film at a splice to create a filmstrip leading end having a first residual splice and a filmstrip trailing end having a second residual splice;

a first die located below the film path and upstream from the splice cutter and a first punch for engaging the first die to re-shape a filmstrip trailing end and remove the first residual splice;

a second die located below the film path and downstream from the splice cutter and a second punch for engaging the second die to re-shape a filmstrip leading end and remove the second residual splice;

first and second film alignment guides located laterally adjacent to and above the first and second dies respectively, the alignment guides each having shoulders for supporting and aligning a filmstrip in the film path over the first and second dies and for returning a filmstrip to the film path after re-shaping;

a first fixed edge guide adjacent the first die and below the film path for receiving a filmstrip from the first film alignment guide and aligning a filmstrip trailing end with the first die;

a second fixed edge guide adjacent the second die and below the film path for receiving a filmstrip from the second film alignment guide and aligning a filmstrip leading end with the second die; and

first and second retractors attached to the first and the second film alignment guides respectively for moving the first and the second film alignment guides in and out of the film path.

5,813,305

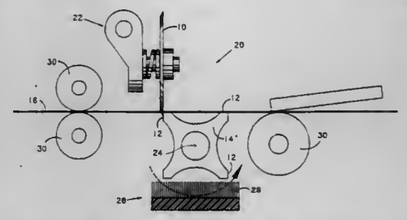
STRIP CUTTER FOR ADHESIVE-BACKED MEDIA

Jay Miazga; Pixie Ann Austin, and Duane M. Fox, all of Marysville, Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Jan. 6, 1995, Ser. No. 369,632

Int. Cl.[6] B26D *1/14*

U.S. Cl. 83—508 **21 Claims**



1. Cutting and feed apparatus for strip media comprising:

a) cutter means having a cutting blade mounted to cut the media transversely at a point of cutting;

b) backing bar means for supporting the media and cooperating with said cutting blade of said cutter means to cut the media; and

c) feed means for moving the media at a forward speed into a position to be cut by the cutting blade;

said backing bar means including a backing bar having a plurality of cutting edges, each said cutting edge including a pointed portion and a support surface, and each said cutting edge having a use position in which its support surface is positioned to support the media as the cutting edge cooperates with the cutting blade to cut the media; said backing bar being rotatable, about a transversely extending axis and simultaneously with movement of the media by said feed means, at a rotational speed producing a tangential speed equal to said forward speed to cause the media to ride up on the pointed portion of one of said cutting edges without dragging across said one of said cutting edges as said one of said cutting edges moves into its use position.

5,813,306

MITER BOX OR SIMILAR ARTICLE

Daniel Jacoff, Mineola, N.Y., assignor to Great Neck Saw Manufacturers, Inc.

Continuation of Ser. No. 457,593, Jun. 1, 1995, abandoned. This application Jan. 22, 1997, Ser. No. 786,258

The portion of the term of this patent subsequent to Jul. 2, 2010, has been disclaimed.

Int. Cl.[6] B27G *5/02*

U.S. Cl. 83—762 **4 Claims**

1. A mitre box comprising a base and a pair of upstanding spaced parallel sidewalls extending upwardly from said base with each sidewall having substantially parallel front and rear end edges and a top edge substantially perpendicular to said front and rear end edges, each sidewall having a predetermined thickness, at least one slot in each of the sidewalls, the slot in one of said sidewalls being in alignment with the slot in the other sidewall, said base having an upper surface which is substantially on one plane, a groove extending across the entire upper surface of said base connecting and communicating with the slot in said sidewalls, ruler marks on said mitre box substantially parallel to said sidewalls and perpendicular to said end edges, notch means between the pair of

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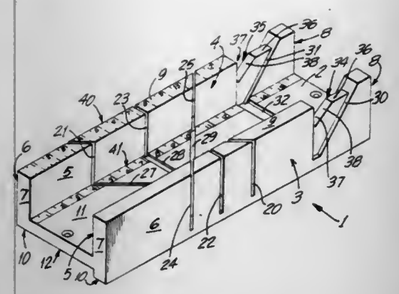


end edges of each of said sidewalls, each of said notch means comprises a notch element having a thickness less than the thickness of the sidewall in which the notch element is located, each notch element having a top edge below the top edge of the sidewall in which each notch edge is located, each notch element having an inclined wall extending from the top edge of the notch element toward said base, the inclined wall of the notch element being connected to and terminating at the sidewall in which the notch element is located, a notch element slot in each side wall between the notch element in the side wall in which the notch element is located and the rear end edge of each of said side walls, said notch element slot extending upwardly from the base and being at an angle to said rear end edge, and a groove extending across the entire upper surface of said base connecting and communicating with the notch element slot in each side wall.

5,813,307

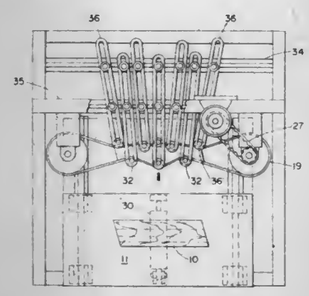
BAND SAW WOODWORKING MACHINE

Paul A. Richmond, c/o Richmond Woodworks Inc. Box 1577 State Rte. 39 NE., New Philadelphia, Ohio 44663

Filed Aug. 13, 1996, Ser. No. 696,154

Int. Cl.[6] B26D *1/54*

U.S. Cl. 83—820 **8 Claims**



1. A band saw woodworking machine comprising:

a table for holding a work piece thereon;

a band saw spaced from said table and having a cutting edge on one side and a band portion on an opposite side;

power means for driving said band saw in a path;

a plurality of idlers positioned to engage both sides of said band saw at the band portion thereof; and

means for adjusting the position of each of said idlers to engage said band saw whereby a portion of said band saw is formed into an undulated shape which cuts curved surfaces in the work piece when said band saw and the work piece come into contact.

5,813,308

SAW TOOTH ATTACK FACE AND EDGE STRUCTURE

Allan J. Wildey, Paris, and Benjamin DiSabatino, Brantford, both of Canada, assignors to Timberjack Inc., Woodstock, Canada

Continuation-in-part of Ser. No. 415,109, Mar. 31, 1995, Pat. No. 5,647,263, which is a continuation-in-part of Ser. No. 219,149, Mar. 29, 1994, Pat. No. 5,579,674. This application Sep. 24, 1996, Ser. No. 710,898

Int. Cl.[6] B27B *33/08*

U.S. Cl. 83—835 **9 Claims**

1. A woodcutting saw tooth of the type having four lateral sides and an attack face at one end of said tooth, the intersection of said attack face with each side forming a cutting edge, wherein the intersection of said attack face with any two adjacent sides forms a corner, the improvement wherein said attack face has four quadrants defined by imaginary mutually orthogonal planes which include an axis of said tooth and bisect the cutting edges, each of said quadrants being the same as the other quadrants, and each of said quadrants including a corner and having a plateau with a flat surface at said corner, and each of said quadrants including a first concave surface adjacent to said plateau which is defined by a section of a first cylinder, said first cylinder being of constant radius and having an axis which is perpendicular to a plane which includes said axis of said tooth and extends through said plateau, said plateau and said first concave surface being coterminous along a first adjoining edge thereof which adjoins said plateau and said first concave surface and extends between adjacent cutting edges of said tooth.

5,813,309

PRESSURE COMPENSATION VALVE UNIT AND PRESSURE OIL SUPPLY SYSTEM UTILIZING SAME

Keisuke Taka, and Kazunori Ikei, both of Tochigi-ken, Japan, assignors to Komatsu Ltd., Japan

PCT No. PCT/JP95/00437, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO95/25228, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 15, 1995, Ser. No. 704,568

Claims priority, application Japan, Mar. 15, 1994, 6-441503

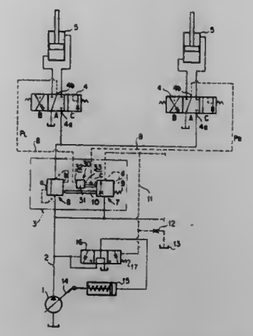
Int. Cl.[6] F15B *11/08*

U.S. Cl. 91—447 **14 Claims**

1. A pressure compensation valve unit comprising:

a check valve which is pushed in an opening direction thereof by an inlet side pressure and in a closing direction thereof by an outlet side pressure; and

means, including a pressure reducing valve, actuating to establish communication between the inlet side and the outlet side of the check valve and block the communication therebetween, said pressure reducing valve means being pushed in the blocking direction by a pressure in a pressure receiving chamber to push the check valve in the closing direction thereof, and being pushed in the communication direction



with a highest pressure selected in a plurality of pressures by a pressure selective receiving means, and communicating said outlet side with said pressure receiving chamber.

5,813,310

WORKING MACHINE FALL PREVENTIVE VALVE APPARATUS

Shuji Hori, and Tadao Karakama, both of Tochigi-ken, Japan, assignors to Komatsu, Ltd., Tokyo, Japan

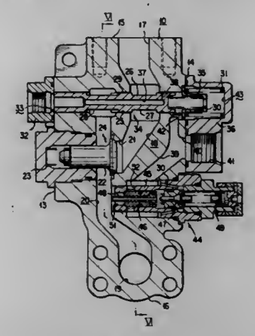
PCT No. PCT/JP95/01545, § 371 Date Feb. 4, 1997, § 102(e) Date Feb. 4, 1997, PCT Pub. No. WO96/04431, PCT Pub. Date Feb. 15, 1996

PCT Filed Aug. 3, 1995, Ser. No. 776,674

Claims priority, application Japan, Aug. 5, 1994, 6-184492

Int. Cl.[6] F15B *11/08*

U.S. Cl. 91—446 **20 Claims**



1. A valve for controlling the flow of fluid in a cylinder, said valve comprising:

a valve body having a cylinder side mounting surface for use in mounting said valve to the cylinder, said cylinder side mounting surface having a cylinder port;

wherein said valve body has formed therein a directional control valve side passage, a cylinder side passage fluidically connected with said cylinder port, and a directional control valve port fluidically connected with said directional control valve side passage;

wherein a check valve is provided in said valve body such that a first plane intersects said check valve and wherein said check valve is operably connected with said directional control valve side passage and said cylinder side passage;

wherein a flow rate control valve is provided in said valve body such that said first plane intersects said flow rate control valve and wherein said flow rate control valve is operably connected with said directional control valve side passage and said cylinder side passage;

wherein a safety valve is provided in said valve body such that said first plane intersects said safety valve and wherein said safety valve is operably connected with said cylinder side passage; and

wherein said first plane is substantially parallel to said cylinder side mounting surface.

5,813,311

HYDRAULIC CONTROL SYSTEM FOR HYDRAULIC WORKING MACHINE

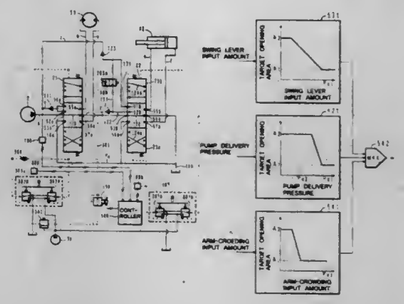
Tsukasa Toyooka, Ibaraki-ken; Toichi Hirata, Ushiku; Genroku Sugiyama, Ibaraki-ken; Shigehiro Yoshinaga, Yokohama; Kouji Ishikawa, Tsuchiura; Youichi Kowatari, and Tsuyoshi Nakamura, both of Ibaraki-ken, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 771,158

Claims priority, application Japan, Dec. 26, 1995, 7-339051

Int. Cl.[6] F15B *11/16*

U.S. Cl. 91—513 **10 Claims**



2. A hydraulic control system for a hydraulic working machine comprising:

a hydraulic source;

a plurality of actuators driven by a hydraulic fluid supplied from said hydraulic source;

a plurality of directional control valves controlling respective flows of the hydraulic fluid supplied to said plurality of actuators, said plurality of directional control valves including first and second directional control valves connected to said hydraulic source in parallel;

auxiliary flow control means disposed in an input line connected to an input port of said second directional control valve;

pressure detecting means for detecting a pressure of the hydraulic fluid supplied from said hydraulic source;

control means for controlling, based on a signal from said pressure detecting means, said auxiliary flow control means to reduce a flow rate of the hydraulic fluid flowing only through said input line when the pressure of the hydraulic fluid supplied from said hydraulic source is high; and

input amount detecting means for detecting an input amount to operate said first directional control valve;

wherein said control means controls, based on signals from said pressure detecting means and said input amount detecting means, said auxiliary flow control means to reduce a flow rate of the hydraulic fluid flowing through said input line when the pressure of the hydraulic fluid supplied from said hydraulic source is high and the input amount to operate said first directional control valve is large.

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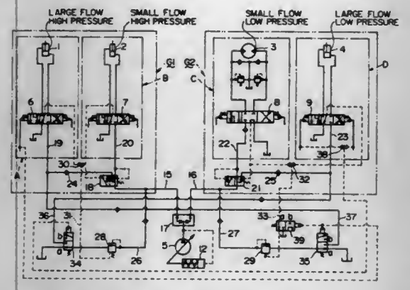
5,813,312

HYDRAULIC CONTROL APPARATUS

Seigo Arai, and Takahiro Kobayashi, both of Akashi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 24, 1996, Ser. No. 653,300
Claims priority, application Japan, May 24, 1995, 7-125335; Jul. 24, 1995, 7-187232
Int. Cl.[6] F15B *11/042*
U.S. Cl. 91—516 8 Claims



1. A hydraulic control apparatus, comprising:

a hydraulic pressure source;

a first group including a combination of a high-pressure actuator circuit and a low-pressure actuator circuit, wherein one of said high-pressure actuator circuit and said low pressure actuator circuit is a large flow rate actuator circuit and the other of said high-pressure actuator circuit and said low pressure actuator circuit is a small flow rate actuator circuit;

a second group including a combination of said high-pressure actuator circuit and said low-pressure actuator circuit, wherein one of said high-pressure actuator circuit and said low pressure actuator circuit, of said second group, is a large flow rate actuator circuit and the other of said high-pressure actuator circuit and said low pressure actuator circuit, of said second group, is a small flow rate actuator circuit, said second group being fluidically connected to said hydraulic pressure source independently of said first group;

a preferential valve provided in each of said first group and said second group, said preferential valve being designed to supply a pressure fluid preferentially to said high-pressure actuator circuit when said high-pressure actuator circuit and said low-pressure actuator circuit within each group are simultaneously operated;

a tank for receiving excess fluid from said first group and said second group;

an unloading circuit for returning said excess fluid from each of said first group and said second group into said tank; and

a confluent line connected to each of said unloading circuits, to supply excess fluid to said large flow rate actuator circuit within each of said first and second groups from the other of said first and second groups in accordance with a demand of said large flow rate actuator circuit within each of said first and second groups.

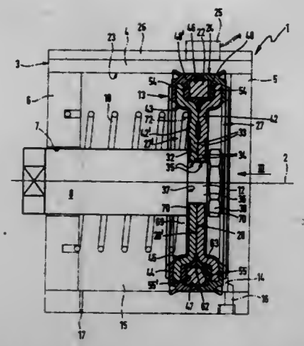
5,813,313

PISTON FOR A FLUID POWER CYLINDER

Kurt Stoll, Esslingen, and Dieter Waldmann, Ebersbach, both of Germany, assignors to Festo KG, Esslingen, Germany

Filed Apr. 24, 1997, Ser. No. 847,451
Claims priority, application Germany, May 3, 1996, 296 07 993.6
Int. Cl.[6] F01B *25/26*
U.S. Cl. 92—5 R 18 Claims

1. A piston for a fluid power cylinder comprising two separate piston parts which are placed together axially in a joint region at mutually facing joint faces with a sealing effect, each piston part



possessing a rigid carrying element having a central section with a central aperture for the attachment of a piston rod, said rigid carrying element possessing an annular carrying section, and the two piston parts having central sections thereof resting against one another in the joint region, whereas their carrying sections are set together with an axial clearance from each other and between them enclose at least a part of an annular holding chamber arranged in the joint region and suitable for accommodating an annular permanent magnet, said chamber having a limiting wall being formed by holding portions molded on each of the carrying elements, each of the holding portions possessing, in a radially outer region thereof, a lip seal for sealingly engaging a running face of the piston, wherein each respective lip seal and the holding portion associated with same are constituted by components of an integral elastic body the body being molded on the respectively associated carrying element, and in the joint region the two elastic bodies engaging one another in at least one sealing zone forming a complete ring surrounding the central aperture and being in sealing engagement with each other.

5,813,314

DOUBLE-HEADED SWASH-PLATE OPERATED RECIPROCATING PISTON TYPE COMPRESSOR WITH IMPROVED THRUST BEARING ASSEMBLIES FOR THE SWASH PLATE

Hiromi Michiyuki; Hayato Ikeda; Masanobu Yokoi; Hisato Kawamura, and Yasunori Ueda, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 16, 1995, Ser. No. 558,725
Claims priority, application Japan, Nov. 18, 1994, 6-285291
Int. Cl.[6] F01B *3/00*
U.S. Cl. 92—71 10 Claims

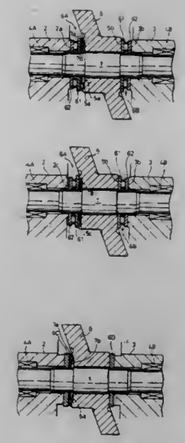
1. A double-headed swash-plate operated refrigerant compressor comprising:

a pair of axially combined front and rear cylinder blocks defining cylinder bores for slidably receiving a plurality of double-headed pistons to compress a refrigerant gas therein, said axially combined cylinder blocks having a pair of front and rear shoulder portions axially spaced apart from and confronting one another at an axially central portion thereof;

front and rear housings arranged for closing front and rear ends of said axially combined cylinder blocks;

an axial drive shaft rotatably supported, via radial bearings, in an axially extending bore centrally formed in said front housing and said combined cylinder blocks;

a swash plate mounted on said drive shaft and rotated together with said drive shaft so as to cause reciprocation of said double-headed pistons, said swash plate being disposed at a position between said front and rear shoulder portions of said combined cylinder blocks and having front and rear boss portions confronting to said front and rear shoulder portions of said combined cylinder blocks; and



front and rear thrust bearing assemblies including front and rear thrust bearings arranged between said front shoulder and boss portions, and between said rear shoulder and boss portions for providing a rigid axial support for said swash plate during rotation of said swash plate about an axis of rotation thereof;

wherein at least one of said front and rear thrust bearing assemblies comprises elastic means arranged between one of said front and rear thrust bearings and one of said front and rear boss portions of said swash plate, said elastic means cooperating with said one of said front and rear thrust bearings so as to change rigidity of the axial support for said swash plate in a stepwise manner in response to a change in an operating condition of said compressor from a low fo high discharge pressure operation and vice versa.

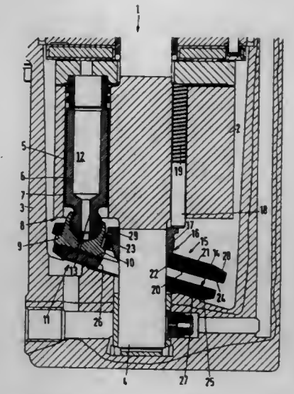
5,813,315

HYDRAULIC PISTON MACHINE HAVING SHEATHING PLASTIC MATERIAL FOR REDUCING FRICTION

Egon Kristensen, Nordborg; Lars Martensen, and Sten Jensen Olesen, both of Sønderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

PCT No. PCT/DK95/00277, § 371 Date Dec. 27, 1996, § 102(e) Date Dec. 27, 1996, PCT Pub. No. WO96/02756, PCT Pub. Date Feb. 1, 1996
PCT Filed Jun. 30, 1995, Ser. No. 765,511
Claims priority, application Germany, Jul. 13, 1994, 44 24 610.2
Int. Cl.[6] F04B *1/20;* F03C *1/06*
U.S. Cl. 92—71 10 Claims

1. A hydraulic piston machine having a cylinder body having at least one cylinder in which a piston is arranged to move back and forth, the piston bearing by way of a slide shoe against a control surface, and having a pressure plate which holds the slide shoe in engagement with the control surface, at least one of the pressure plate and a swash plate having the control surface having a layer of



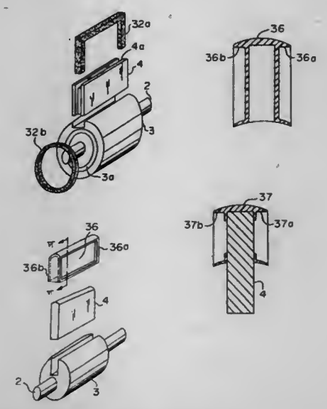
a friction-reducing plastics material with at least one of the pressure plate and the swash plate being sheathed in the friction-reducing plastics material.

5,813,316

ROTARY HYDRAULIC ACTUATOR

Mutsuo Sekiya, Tokyo; Katsuyuki Fukuhara, Kobe, and Masafumi Sugawara, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1997, Ser. No. 822,755
Claims priority, application Japan, Oct. 8, 1996, 8-267604
Int. Cl.[6] F01C *9/00*
U.S. Cl. 92—121 7 Claims



1. A rotary hydraulic actuator comprising:

a hermetic casing having an inner curved wall formed therein;

a rotary member housed in said casing;

an output shaft integrally formed with said rotary member;

a vane slidably rotatable on said inner curved wall and dividing the inside of said casing into a first hydraulic chamber and a second hydraulic chamber, wherein said vane has a flat shape and has one end coupled with an outer peripheral portion of said rotary member;

said first and second hydraulic chambers having a hydraulic working fluid supplied therein to cause rotation of said vane and thereby transfer torque to said output shaft; and

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a sliding member made of fluoroelastomer or polytetrafluoroethylene resin and coated on a slidable contacting portion of said inner curved wall by baking.

5,813,317

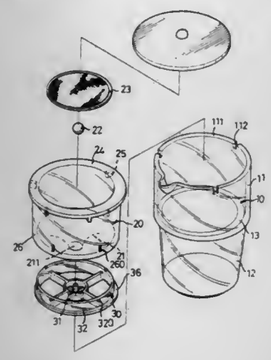
BREWING POT

Keng-Hao Chang, 7th Fl.-1, No. 806, Sec. 1, Meitsun Rd., Taichung, Taiwan

Filed Dec. 15, 1997, Ser. No. 990,477

Int. Cl.[6] A47J *31/00;31/06;31/10;31/40*

U.S. Cl. 99—285 **7 Claims**



1. A brewing pot comprising:

a container (**10**) including an upper portion (**11**) having an open top rim (**111**) defining at least one cavity (**112**) therein, and a lower portion (**12**) having a dimension smaller than that of said upper portion (**11**) and defining a chamber (**120**) therein, and an abutting edge (**13**) formed between said upper portion (**11**) and said lower portion (**12**);

a supporting base (**30**) received in said upper portion (**11**) of said container (**10**) and including an outer wall (**32**) formed with an annular shoulder (**36**) supported on said abutting edge (**13**), and an upright post (**31**) formed on a central portion of said supporting base (**30**); and

a cylindrical body (**20**) rotatably received in said upper portion (**11**) of said container (**10**) and slidably mounted over said outer wall (**32**) of said supporting base (**30**), said cylindrical body (**20**) including a top portion formed with an annular flange (**24**) located above said top rim (**111**) of said container (**10**), and a bottom portion (**21**) defining a socket (**211**) located above said upright post (**31**), at least one block (**25**) formed on an underside of said annular flange (**24**) to rotate therewith and abutting on said top rim (**111**) of said container (**10**), and a control ball (**22**) detachably received in said socket (**211**);

wherein, said cylindrical body (**20**) together with said supporting base (**30**) can be rotated relative to said container (**10**) to a position where said block (**25**) can be received in said cavity (**112**) such that said cylindrical body (**20**) can be moved downward relative to said supporting base (**30**) while said control ball (**22**) can be moved toward said post (**31**) such that said control ball (**22**) can be urged by said post (**31**) to detach from said socket (**211**).

5,813,318

INDIVIDUAL UNIT FOR PREPARING AND SERVING COFFEE FOR "ESPRESSO" TYPE COFFEEMAKER

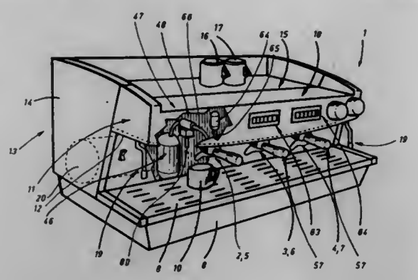
Yvano Zanin, Dupplgheim, and Jean-Paul Farrugia, Scharrachbergheim, both of France, assignors to Reneka International Zone Industrielle, Duttlenheim, France

Filed Dec. 20, 1996, Ser. No. 772,318

Claims priority, application France, Dec. 21, 1995, 95 15774; Dec. 21, 1995, 95 15773

Int. Cl.[6] A47J *31/24*

U.S. Cl. 99—291 **20 Claims**



1. An individual coffee preparation unit for the preparation and distribution of coffee for an espresso coffeemaker, the individual coffee preparation unit comprising:

a body (**8**) having a lower support plate (**9**) for supporting at least one cup and a front portion (**11**) of the individual coffee preparation unit having a lower base plate (**12**), spaced from the lower support plate (**9**), supporting a plurality of coffee preparation units (**2, 3, 4**), each one of the plurality of coffee preparation units (**2, 3, 4**) having a coffee injection group (**40, 41**) connected to a supply of electrically heated water for receiving water and preparing coffee;

wherein each one of the injection groups (**40, 41**) is connected to an individual heating unit (**46**) via a first flexible hydraulic connector (**47**), an electrovalve (**48**) is provided in the flexible hydraulic connector (**47**) to control a flow of heated water therethrough, and each one of the injection groups (**40, 41**) comprises a succession of assembled elements directly attached to the subsurface of the lower base plate (**12**) of the front portion (**11**), the succession of assembled elements defines an distribution chamber communicating with a spray element (**51**), and a holder (**55**) is attached to the subsurface of the lower base plate (**12**) for supporting a container supporting coffee, and an end of the first flexible hydraulic connector (**47**), remote from the individual heating unit (**46**), communicates with the distribution chamber for supplying heated water to the injection group (**41**) for preparing coffee.

5,813,319

TEMPERATURE MAINTAINING DEVICE OF COFFEE MAKER

Kyong-Sik Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

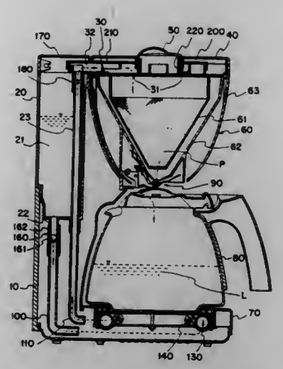
Filed Sep. 18, 1997, Ser. No. 933,331

Claims priority, application Rep. of Korea, Nov. 8, 1996, 96-52858

Int. Cl.[6] A47J *31/00*

U.S. Cl. 99—299 **2 Claims**

1. A temperature maintaining device of a coffee maker having a hot water discharging tube in which a hot water heated by a heater is expanded to be discharged, a hot water chamber which forms a hot water flowing portion on the one side thereof, for guiding the hot water supplied from said hot water discharging tube to a filter assembling body in which coffee powder is put in, and a top cover for covering the upper surface of said hot water chamber and forms



an appearance thereof, and a control knob which controls an amount of the hot water dropped to said filter assembling body to thereby adjust density of coffee liquid, said temperature maintaining device comprising:

a hot water chamber cover formed between said hot water chamber and said top cover, for closing atmosphere existing therebetween, to prevent temperature of the hot water passing through said hot water chamber to be decreased.

5,813,320

GAS APPLIANCE FOR HEATING AND/OR COOKING FOOD AND THE LIKE

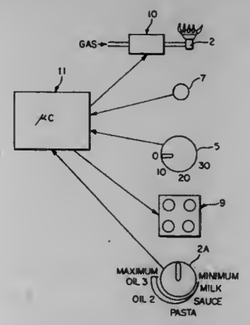
Luca Frasnetti, Cunardo; Gianpiero Santacatterina, Sangiano, and Alessandro Distaso, Gemonio, all of Italy, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 14, 1997, Ser. No. 843,199

Claims priority, application Italy, Apr. 15, 1996, MI96A0721

Int. Cl.[6] A21B *1/00;* **A23L** *3/00;* **F24C** *3/00;* **A47J** *27/26*

U.S. Cl. 99—333 **8 Claims**



1. A gas appliance for heating and/or cooking food by burners fed via solenoid valves controlled by signals derived from pulse-width modulation of another signal, the appliance comprising timer means operated by the user to set the cooking or heating time, a plurality of knobs, also operated by the user, to set the heat output of the burners, and control means for providing the solenoid valves with said signals on the basis of the set cooking or heating time and the set heat output, wherein after setting the cooking or heating time and within a certain time period from said setting, the first of said plurality of means operated by the user for setting the heat output makes the operation of the relative burner dependent on the set time.

5,813,321

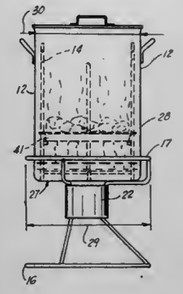
GAS FIRED OUTDOOR COOKING APPARATUS FOR SELECTIVELY BOILING OR STEAMING FOOD ITEMS

Norman R. Bourgeois, Kenner, La., assignor to Metal Fusion, Inc., Jefferson, La.

Filed Mar. 10, 1997, Ser. No. 813,463

Int. Cl.[6] A47J *37/00;37/04;43/18*

U.S. Cl. 99—340 **15 Claims**



1. A cooking apparatus for enabling a user to cook either by steaming or by boiling a liquid, comprising:

a) a burner having a base for engaging an underlying support surface, the burner having a jet for generating a high intensity flame for use in cooking, a supply hose for supplying propane to the burner, the burner having a support surface for cradling a pot;

b) a pot that includes a generally flat bottom portion and a generally cylindrically shaped continuous sidewall, the pot having a generally cylindrically shaped interior;

c) a basket that fits inside the pot interior, the basket having a base that registers against the bottom of the pot, a vertically extending portion and a bail that can removably attach to the basket at the periphery of the pot;

d) the burner including an upper ring that is supported above the bottom of the pot, the upper ring being supported by a plurality of generally "ell" shaped struts that extend from the ring downwardly along a generally vertical path and horizontally to cradle the bottom of the pot;

e) a steamer plate that can be removably attached to the basket at a position generally in between the bottom of the basket and the top of the basket, the steamer plate having an array of openings therethrough for enabling steam to travel through the openings to engage a food product contained on the upper surface of the plate.

5,813,322

DIE HEIGHT CORRECTING APPARATUS FOR PRESS

Yoshiaki Kuroda, Ishikawa-ken, Japan, assignor to Komatsu Ltd., and Komatsu Industries Corporation, both of Tokyo, Japan

PCT No. PCT/JP96/00137, § 371 Date Jul. 29, 1997, § 102(e) Date Jul. 29, 1997, PCT Pub. No. WO96/23653, PCT Pub. Date Aug. 8, 1996

PCT Filed Jan. 25, 1996, Ser. No. 875,477

Claims priority, application Japan, Jan. 31, 1995, 7-013415

Int. Cl.[6] B30B *15/14;15/26*

U.S. Cl. 100—43 **6 Claims**

1. A die height correcting apparatus for a press having a press body with sides formed by C-shaped frames and a slide positioned on an upper portion of the press body, the apparatus comprising:

an auxiliary frame provided on a side surface of at least one of the C-shaped frames, the auxiliary frame being pivotably mounted at a lower end to the C-shaped frame and having a free upper end;

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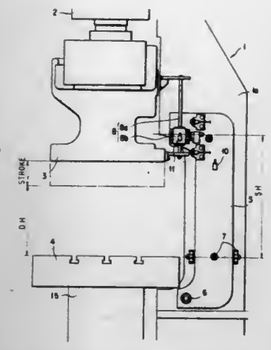


a slide position detecting means positioned on said upper end of said auxiliary frame;

a temperature detecting means positioned on said upper end of said auxiliary frame; and

a controller for controlling the slide based on a slide position detected by said slide position detecting means;

wherein:

said temperature detecting means detects a temperature of said upper end of said auxiliary frame,

said controller calculates an expansion amount of said auxiliary frame and a temperature drift of said slide position detecting means based on a temperature variation amount derived from comparison of the temperature detected by said temperature detecting means and a preliminarily set reference temperature; and

said controller corrects the slide position based on the calculated expansion amount and temperature variation amount.

5,813,323

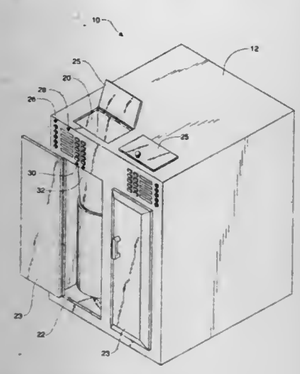
MULTIPLE-BIN WASTE COMPACTOR

Esther C. Nowak, P.O. Box 876, Eagle River, Wis. 54521

Filed Sep. 8, 1997, Ser. No. 925,042

Int. Cl.[6] B30B *15/00;9/30*

U.S. Cl. 100—52 **5 Claims**



1. A waste compactor comprising:

a. a housing;

b. a rotating means;

c. a plurality of bins configured to be removably positioned on the rotating means;

d. the housing having structure forming a plurality of first openings therein, the first openings positioned substantially above the bins when the waste compactor is ready is for use;

e. the housing having structure forming a plurality of second openings therein, the second openings configured to permit the bins to be removed there-through;

f. each of the second openings being beneath a corresponding one of the first openings:

g. the rotating means configured to rotate a selected one of the bins into position adjacent a selected one of the first openings and a corresponding one of the second openings simultaneously, such that waste can be transferred through the selected one of the first openings into the selected one of the bins, and such that the selected one of the bins can be removed through the second opening corresponding to the selected one of the first openings;

h. a compacting means adapted to compact waste within the bins; and

i. the rotating means further configured to rotate a chosen une of the bins into position adjacent the compacting means such that the compacting means can compact waste within the chosen one of the bins.

5,813,324

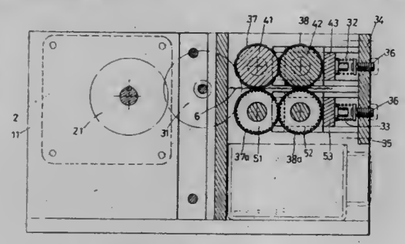
NEEDLE DESTRUCTION DEVICE

A-Fang Lin, 58, Ma Yuan West St., Taichung, Taiwan

Filed Nov. 6, 1997, Ser. No. 965,656

Int. Cl.[6] B30B *3/04;9/00;* **B02C** *9/04*

U.S. Cl. 100—91 **2 Claims**



1. A needle destruction device comprises:

a main frame,

a lateral plate disposed on the main frame,

a motor disposed on the main frame,

a motor shaft extending from the motor,

a drive gear connected to a first end of the motor shaft,

a follower gear engaging with the drive gear,

an upper guide plate disposed in the main frame,

a lower guide plate disposed in the main frame and beneath the upper guide plate,

an upper slot defined between the upper guide plate and the main frame,

a lower slot defined between the lower guide plate and the main frame,

a first block seat disposed on the upper guide plate,

a first plug disposed on the lateral plate,

a first spring disposed between the first block seat and the first plug,

a first stud fastening the first plug on the lateral plate,

a second block seat disposed on the upper guide plate,

a second plug disposed on the lateral plate,

a second spring disposed between the second block seat and the second plug,

a second stud fastening the second plug on the lateral plate,

a first upper roller disposed in the main frame,

a second, upper roller disposed in the main frame abutting the first upper roller,

a first lower roller disposed in the main frame beneath the first upper roller,

a second lower roller disposed in the main frame abutting the first lower roller and beneath the second upper roller,

a first upper shaft extending from the first upper roller,

a first upper driven gear connected to a first end of the first upper shaft,

a second upper shaft extending from the second upper roller,

a second upper driven gear connected to a first end of the second upper shaft,

a first lower shaft extending from the first lower roller,

a first lower driven gear connected to a first end of the first lower shaft,

a second lower shaft extending from the second lower roller,

a second lower driven gear connected to a first end of the second lower shaft,

the first upper driven gear engaging with the follower gear,

the second upper driven gear engaging with the first upper driven gear,

the first lower driven gear engaging with the follower gear, and

the second lower driven gear engaging with the first lower driven gear.

5,813,325

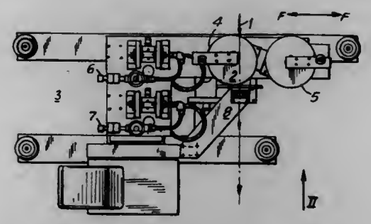
RING MARKER

Kurt Descovich, Vienna, Australia, assignor to Medek & Schürner Gesellschaft m.b.H., Wien, Australia

Filed Aug. 20, 1996, Ser. No. 700,193

Int. Cl.[6] B41F *17/10*

U.S. Cl. 101—36 **3 Claims**



1. A twin marking device comprising two color disks which rotate about axes of rotation and alternatingly release coloring agent for applying markings onto the insulating sheathing of a wire, wherein the wire is moved in a wire travel direction essentially along a straight line past the color disks, wherein

a) the axes of rotation of the two color disks extend essentially in a plane normal relative to the wire travel direction in the area of the color disk;

b) means for alternatingly moving one of the two color disks in a moving direction between an active position in which the color disk marks the wire and an inactive position in which the color disk is spaced from the wire and for moving another of the two color disks in the moving direction between an inactive position in which the color disk is spaced from the wire and an active position in which the color disk marks the wire; and

c) wherein the moving direction of each of the color disks between the active position and the inactive position extends essentially normal relative to the wire travel direction.

5,813,326

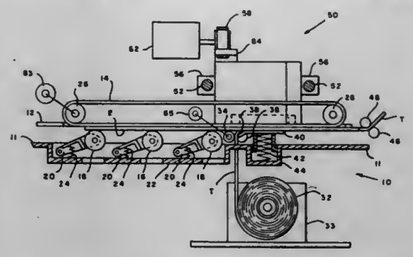
MAILING MACHINE UTILIZING INK JET PRINTER

James A. Salomon, Cheshire, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 362,330, Dec. 22, 1994, Pat. No. 5,467,709. This application Aug. 16, 1995, Ser. No. 515,771

Int. Cl.[6] B41J *11/00;1/00*

U.S. Cl. 101—93 **14 Claims**



1. A mailing machine for printing on first and second recording mediums passing therethrough, the mail machine comprising:

a first feed path, including a first feed path printing position, along which the first recording medium is fed to the first feed path printing position;

a second feed path including a second feed path printing position, along which the second recording medium is fed to the second feed path printing position;

a printing device mounted for movement between the first and second feed path printing positions; and

means for moving the moving the printing device between the first and second feed path printing positions;

wherein at times when the printing device and the first recording medium are each at the first feed path printing position the printing device prints on the first recording medium, and when the printing device and the second recording medium are each at the second feed path printing position the printing device prints on the second recording medium.

5,813,327

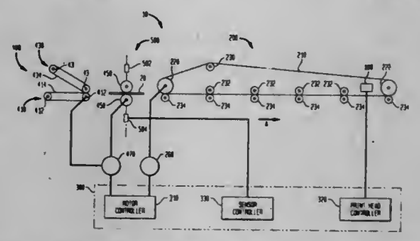
ARTICLE TRANSPORT APPARATUS

Gerald C. Freeman, Norwalk, Conn.; Douglas M. Mattingly, Cary, N.C., and Edilberto I. Salazar, Brookfield, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 26, 1996, Ser. No. 773,149

Int. Cl.[6] B41J *13/26*

U.S. Cl. 101—93 **8 Claims**



1. In a mailing machine, an apparatus for transporting mailpieces comprising:

means for feeding the mailpieces in a path of travel;

means for determining the length of the mailpieces; and

control means in operative communication with the determining means and the feeding means, the control means for adjusting the gap between a first mailpiece having a determined length and a second mailpiece to establish a fixed pitch between the

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first mailpiece and the second mailpiece if the determined length is equal to or less than a predetermined value.

5,813,328

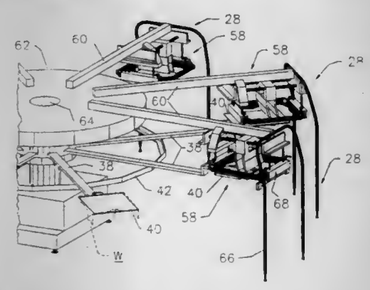
REGISTRATION SYSTEM FOR SCREEN PRINTING

Alan J. Hamu, Huntington Beach, Calif., assignor to Kaino J. Hamu, Huntington Beach, Calif.

Filed Sep. 30, 1994, Ser. No. 316,229

Int. Cl.[6] B41L *13/04*

U.S. Cl. 101—116 **23 Claims**



1. In a screen printing machine comprising (A) a plurality of print heads each including a screen frame mounting a printing screen bearing a screen image to be printed, a screen frame support for removably receiving said screen frame and supporting said frame for edgewise adjustment of said frame relative to the respective print head, and frame securing means for releasably securing said frame in fixed position relative to the respective print head, (B) work support means including a plurality of work supports for supporting work pieces to be printed, and (C) means for relatively moving said print heads and said work supports to aling the work supports with the print heads in succession and effect relative movement of the work supports to successive printing positions wherein each work support is aligned with a print head and is disposed in printing relation to the screen frame of the respective print head, the improvements comprising:

registration means for registering said screen frames to said work supports by registering each screen frame directly to a selected work support when the respective frame is released for edgewise adjustment relative to the corresponding print head, and the selected work support is aligned with and occupies a certain registration position relative to the corresponding print head, and wherein

said registration means comprises a registration device on said selected work support, and alignment means directly engagable between each screen frame and said registration device when said selected work support occupies said registration position at the corresponding print head for aligning the respective frame in a predetermined registered position relative to said registration device wherein the respective frame occupies a certain position relative to the corresponding print head and the respective frame occupies a predetermined registered position relative to each work support located in said printing position relative to the respective print head, and

said frame securing means of each print head are operative to secure the corresponding screen frame in said certain position relative to the respective print head.

5,813,329

PRINTER FOR WRAPPING STENCIL AROUND DRUM

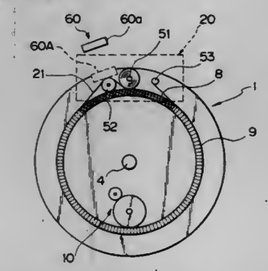
Hiroshi Tateishi, Fujinomiya; Fumiaki Arai, and Tetsuo Tanaka, both of Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, and Tohoku Ricoh Co., Ltd., Miyagi-ken, both of Japan

Continuation of Ser. No. 174,334, Dec. 28, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,764

Claims priority, application Japan, Dec. 29, 1992, 4-361163; Dec. 29, 1992, 4-361164

Int. Cl.[6] B41L *13/04;13/14*

U.S. Cl. 101—116 **15 Claims**



1. A printer using a stencil, comprising:

a drum having a drum axis and a portion permeable to ink in a part of a peripheral wall thereof and allowing a cut portion of the stencil to be wrapped therearound;

means for rotating said drum about the drum axis;

ink supplying means disposed internally of said peripheral wall of the drum;

a stencil feed and discharge unit adjoining an outer periphery of said peripheral wall of said drum, said stencil feed and discharge unit comprising at least a feed section accommodating the stencil in the form of a roll, a discharge section for taking up and accommodating said used stencil, and a platen roller for use in cutting said stencil;

means for rotating at least one of said feed section and said discharge section about the drum axis along said outer periphery of said peripheral wall of said drum; and

cutting means located externally of the peripheral wall of the drum and being positioned stationary away from said drum during wrapping of the stencil about the drum, and pressing, in the event of making a master, against said platen roller to image the stencil by heat cutting.

5,813,330

ADJUSTABLE FLEXIBILITY SQUEEGEE WITH REPLACEABLE CONTACT BLADE

Don E. Newman, Wyncote, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Filed Jun. 10, 1996, Ser. Nu. 662,561

Int. Cl.[6] B05C *17/04*

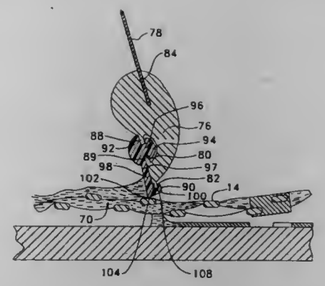
U.S. Cl. 101—123 **15 Claims**

1. A squeegee for interacting with ink and a printing screen, comprising:

a mounting head having an attachment portion adapted to receive a force for moving the squeegee generally parallel to a plane defined by the printing screen;

a blade mount connected to the mounting head, the mounting head and blade mount being fabricated from a material which is resistant to molecular change caused by interaction with the ink, the blade mount having a female interlocking coupling mounted thereon, said female interlocking coupling comprising a pair of legs which define a locking groove, one of the legs defining an elongated backing plate; and

a contact blade for engaging the printing screen and interacting with the ink, the contact blade having a male interlocking coupling and a backing face which is complementary with



and conforms to the elongated backing plate. the male interlocking coupling comprising a necked tab protruding from the backing face and being detachably received in the locking groove.

5,813,331

METHOD OF PRINTING WITH A DIFFERENTIAL THICKNESS STENCIL

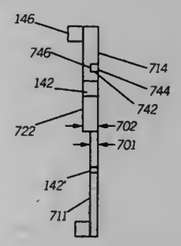
Teik J. Tan; Lam C. Aun, and Ka T. Lim, all of Penang, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 645,404, May 13, 1996, abandoned. This application Oct. 16, 1997, Ser. No. 951,869

Claims priority, application Malaysia, Sep. 22, 1995, P19502828

Int. Cl.[6] B41M *1/12*

U.S. Cl. 101—129 **2 Claims**



1. A method of forming a mixed-pitch stencil, comprising the following steps:

providing a first sieve portion;

forming, within the first sieve, at least a first through-hole of a first height from a first top surface portion of the stencil to a bottom surface of the stencil for dispensing solder deposits onto a substrate adjacent the bottom surface of the stencil;

providing a second sieve portion;

joining the first sieve portion to the second sieve portion;

forming, within the second sieve portion, at least a second through-hole of a second height from a second top surface portion of the stencil to the bottom surface of the stencil for dispensing solder deposits onto a substrate adjacent the bottom surface of the stencil;

forming at least one inverted well within the second sieve portion on the bottom surface of the stencil; and

positioning and sizing the inverted well to covers the solder deposits dispensed onto the substrate from the first sieve portion.

5,813,332

DEVICE FOR REMOISTENING A WEB OF PRINTED MATERIAL

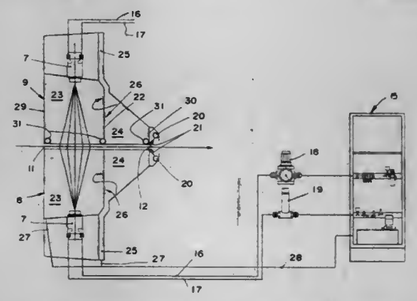
Karl-Heinz Reichel-Langer, Wemding; Werner Kettl, Neusäss, and Peter Schüller, Mering, all of Germany, assignors to Grafotec GmbH, Diedorf, Germany

Filed Apr. 17, 1997, Ser. No. 842,886

Claims priority, application Germany, Apr. 17, 1996, 196 15 198.8

Int. Cl.[6] B41L *23/00*

U.S. Cl. 101—147 **15 Claims**



1. A remoistening device for remoistening a freshly printed and dried web of printed material, comprising:

a dryer;

a cooling device;

a housing through which the web of printed material runs defining thereby a conveyance plane, said housing being situated between said dryer and said cooling device, said housing including an upper housing area and a lower housing area, said upper and lower housing areas defining an inlet slot and an outlet slot through which the web of printed material pass;

a plurality of spray nozzles arranged above and beneath said conveyance plane, said nozzles being supplied with a moistening agent;

drip catchers arranged at the lower edges of the walls of said upper housing area, and which cross said conveyance plane; and

air squeegee devices provided at least in the area of said outlet slot, said air squeegee devices being charged with compressed air and being situated across from each other with respect to said conveyance plane.

5,813,333

AUTOMATIC REGISTER CONTROL SYSTEM FOR MULTI-COLOR ROTARY PRESSES, AND APPARATUS AND METHOD FOR DETECTING REGISTERING ERRORS

Kinichiro Ohno, Tokyo, Japan, assignor to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Filed Aug. 3, 1995, Ser. No. 510,610

Claims priority, application Japan, Aug. 8, 1994, 6-185657; Aug. 16, 1994, 6-192410; Aug. 16, 1994, 6-192411

Int. Cl.[6] B41F *7/04;5/08;5/16*

U.S. Cl. 101—181 **31 Claims**

1. A registering error detecting method comprising the steps of:

providing a web:

providing a plurality of printing sections printing on said web as said web travels through said plurality of printing sections, each of said plurality of printing sections having a plate cylinder printing a predetermined color and corresponding register mark on said web, each said register mark having a reference point;

reading said register marks printed on said web by each of said printing sections with a plurality of CCD cameras as image

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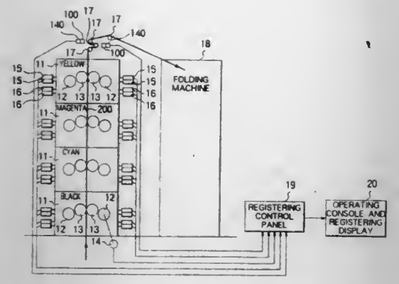


data, each CCD camera reading a separate said register mark and having a CCD sensor with a predetermined CCD coordinate position;

correcting said image data using an inherent correcting means;

calculating reference points of said register marks as a reference coordinate position;

calculating a deviation between actual coordinate positions of said detected reference points and target coordinate positions of said reference points with respect to said CCD coordinate position;

generating an adjusting signal based on said detected deviation;

adjusting a phase of a plate cylinder in said each printing section to automatically adjust registering errors in multi-color rotary presses.

5,813,334

CYLINDER WITH A PRINTING COVER FOR OFFSET PRINTING

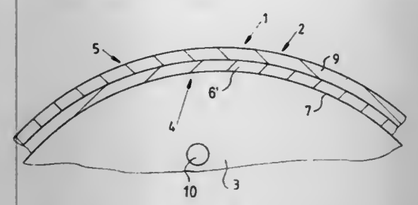
Alain Blanchard, Gouvieux, France, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, S.A., Montataire Cedex, France

Filed Jul. 25, 1996, Ser. No. 686,379

Claims priority, application France, Jul. 25, 1995, 95 09002

Int. Cl.[6] B41F *7/02;23/04*

U.S. Cl. 101—217 **8 Claims**



1. A blanket cylinder, comprising a basic cylinder body and a printing blanket disposed on an outer cylindrical surface of said cylinder body, the printing blanket comprising a plurality of layers including an outermost printing blanket layer and a heat-removing layer, said heat-removing layer being disposed between said outermost printing blanket layer of the printing blanket and the outer cylindrical surface of said cylinder body.

5,813,335

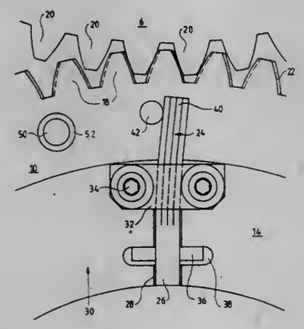
APPARATUS FOR PREVENTING BACKLASH BETWEEN THE MESHING TEETH OF A FIRST AND A SECOND GEAR IN A PRINTING UNIT OF A LITHOGRAPHIC ROTARY PRINTING PRESS

David Charles Burke, Portsmouth, and Richard Edward Breton, Rochester, both of N.H., assignors to Heidelberg Harris Inc., Dover, N.H., and Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Dec. 18, 1996, Ser. No. 769,055

Int. Cl.[6] B41F *7/02*

U.S. Cl. 101—217 **17 Claims**



1. A rotary printing press comprising:

a supplementary gear rotatably mounted adjacent to a plate cylinder gear and rotatable about a rotational axis of the plate cylinder gear, teeth of the supplementary gear being in meshing engagement with teeth of a blanket cylinder gear;

a support element formed on at least one of the plate cylinder gear and the supplementary gear; and

a leaf spring assembly having a first end portion extending substantially radially with respect to the rotational axis of the plate cylinder gear, a second end portion of the leaf spring assembly being bent out of its zero-position and engaging the support element to apply force to the support element which biases the supplementary gear and the plate cylinder gear to rotate in opposite directions.

5,813,336

PRINTING UNIT WITH AXIALLY REMOVABLE PRINTING SLEEVES

Glenn A. Guaraldi, Kingston; Roland T. Palmatier, Durham, and Roger R. Belanger, Dover, all of N.H., assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.

Filed Dec. 22, 1995, Ser. No. 577,642

Int. Cl.[6] B41F *7/02*

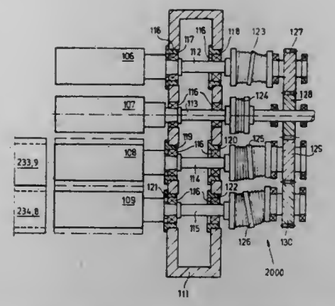
U.S. Cl. 101—218 **22 Claims**

1. A printing unit, comprising:

a gear-side frame;

a print cylinder, a first positioning mechanism, and a first flexible coupling, the print cylinder having a first end and a second end, the first end of the print cylinder rotatably supported within the gear-side frame by the first positioning mechanism, the first positioning mechanism adjusting a radial position of the print cylinder, the first positioning mechanism including a housing having a bearing eccentrically mounted therein, the first end of the print cylinder attached to the first flexible coupling;

a blanket cylinder having a first end and a second end, the first end of the blanket cylinder rotatably mounted within the gear-side frame; and



a drive assembly coupled to the blanket cylinder, and to the first flexible coupling, the drive assembly driving the blanket cylinder and the print cylinder.

5,813,337

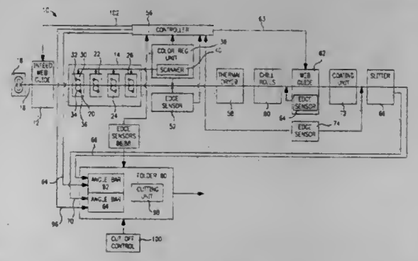
CLOSED-LOOP PRINTING CONTROL SYSTEM

Lawrence R. Peters, Brookfield; Keith A. Tabor, Richfield; Michael J. Horvath, Germantown; Mark Hackler, Pewaukee, and Robert Knier, Muskego, all of Wis., assignors to Quad/Tech, Inc., Sussex, Wis.

Filed Jun. 5, 1996, Ser. No. 658,279

Int. Cl.[6] B41F *13/54*

U.S. Cl. 101—228 **21 Claims**



1. A method for controlling the lateral position of a travelling web in a web-fed printing press, the web travelling in a longitudinal direction and having a series of printed images thereon, the method comprising the steps of:

determining the lateral position of an image on the web with respect to a web edge for a series of selected images as the selected images pass a first point;

storing the lateral position along with data indicative of the longitudinal position of the image on the web for each selected image;

calculating a control signal based on the lateral position for each selected image; and

using the data indicative of the longitudinal position to provide the control signal at the appropriate time to a web positioning device responsive thereto and located downstream of the first point to laterally position the web to generally maintain a predetermined lateral distance between each selected image and a web processing device.

5,813,338

GRIPPER OPENING/CLOSING MECHANISM OF SHEET TRANSFER CYLINDER IN SHEET-FED PRINTING MACHINE

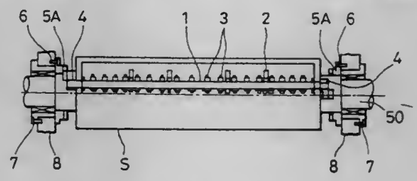
Yasutaka Kojima, Yawara, and Masaaki Sugamo, Mitsukaido, both of Japan, assignors to Akiyama Printer Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1997, Ser. No. 916,261

Claims priority, application Japan, Oct. 31, 1996, 8-289433

Int. Cl.[6] B41F *7/06*

U.S. Cl. 101—231 **11 Claims**



1. A gripper opening/closing mechanism of a sheet transfer cylinder in a sheet-fed printing machine, comprising:

a plurality of grippers;

a gripper shaft whereupon said plurality of grippers are disposed over specific intervals; and

a cam mechanism provided at two ends of said gripper shaft that causes said gripper shaft to move when said sheet transfer cylinder has rotated to a first specific position so that said grippers and an external circumferential side surface of said sheet transfer cylinder come in contact with each other and causes said gripper shaft to move in an opposite direction when said sheet transfer cylinder has rotated to a second specific position so that said grippers and said external circumferential side surface of said sheet transfer cylinder are separated from each other.

5,813,339

CARTRIDGE FOR REFILLING A PRINTING CARTRIDGE WITH INK

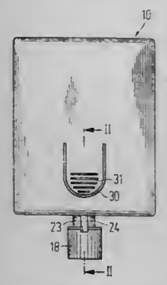
Franz-Ulrich Schmitt; Kurt Moser, both of Gerlingen; Friedhelm Czeranski, Dortmund, and Christian Geiermann, Wuppertal, all of Germany, assignors to Laser Care Modul Recycling GmbH, Ohringen, Germany

Filed Sep. 30, 1997, Ser. No. 941,225

Claims priority, application Germany, Nov. 7, 1996, 296 19 296.1

Int. Cl.[6] B41F *35/00*

U.S. Cl. 101—335 **20 Claims**



1. A cartridge for refilling a printing cartridge with ink, comprising:

a chamber which holds an ink supply, said chamber comprising a foil pouch and a solid housing, said solid housing surrounding said foil pouch;

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a hollow needle projecting from said solid housing and having a free end;

a rubber elastic sealing element arranged at said free end of said hollow needle and being penetrated by said hollow needle;

a retaining element arranged to secure said rubber elastic sealing element and to shield said hollow needle;

wherein said retaining element is moveable in a lengthwise direction of said hollow needle to expose said free end.

5,813,340

Patent Not Issued For This Number

5,813,341

PRINT IMAGE TREATMENT DEVICE

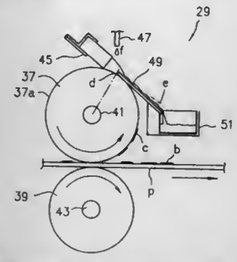
Takahito Tojima; Ryuji Higa; Takashi Isozaki, and Sadanao Okuda, all of Ibaraki-ken, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Sep. 10, 1996, Ser. No. 709,831

Claims priority, application Japan, Jun. 20, 1996, 8-159870

Int. Cl.[6] B41F *35/00*

U.S. Cl. 101—416.1 **4 Claims**



1. A print image treatment device, comprising:

a contact member having a peripheral surface adapted to be coated with an excessive ink removing liquid incompatible with printing ink for forming a print image and having a lower surface tension than said printing ink, said contact member being rotated in a specific direction;

a facing member situated adjacent the contact member and serving to bring a printed side of a printed sheet into contact with said excessive ink removing liquid by feeding said printed sheet nipped between said contact member and said facing member;

supply means for supplying said excessive ink removing liquid to said peripheral surface of said contact member; and

cleaning means which contacts said peripheral surface of said contact member, said cleaning means being an elastic member having a hardness of 30 to 90 degrees by a spring-type hardness testing machine type A specified by JIS K 6301 and contacting said contact member with a pressure of 0.5 to 20 kg/cm^2 and with an angle from a tangent line of said peripheral surface within a range of 5 to 60 degrees.

5,813,342

METHOD AND ASSEMBLY FOR PRODUCING PRINTING PLATES

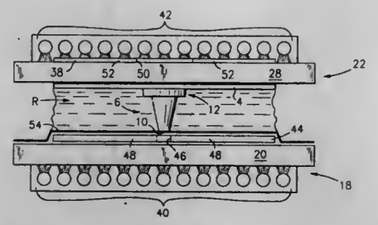
Kenneth M. Strong, Hockessin, Del., assignor to MacDermid Imaging Technology, Incorporated, Waterbury, Conn.

Filed Mar. 27, 1997, Ser. No. 829,321

Int. Cl.[6] G03F *7/26;* **G03B** *27/04*

U.S. Cl. 101—401.1 **5 Claims**

1. A system for producing cross-linked photopolymerized printing plates, said system comprising:



A) first and second opposed banks of UV lights for selectively cross-linking a layer of a photopolymerizable resin;

B) first and second support plates between said first and second banks of lights for confining the layer of resin during production of a printing plate;

C) a first negative interposed between the layer of resin and said first bank, said first negative including transparent portions and opaque portions, said transparent portions being operable to define cross-linked resin printing surfaces on the plate being formed and said opaque portions being operable to define areas on the plate wherein the resin will not be cross-linked; and

D) a second negative interposed between said second support plate and said second light bank, said second negative including transparent portions and opaque portions, said transparent portions on said second negative being aligned with said transparent portions on said first negative so as to define individual cross-linked resin floors on the plate which are shaped like the printing surfaces but are larger than the printing surfaces, and said opaque portions on said second negative being operable to define areas on the plate wherein the resin will not be cross-linked.

5,813,343

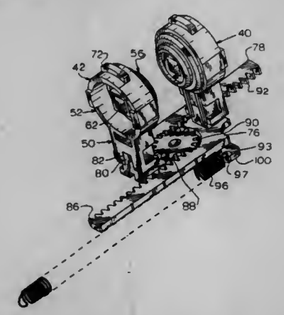
PRINTING MEDIA ROLL MOUNTING AND POSITIONING MECHANISM

Douglas L. Harb, Woodland Hills, Calif., assignor to Eltron International, Inc., Simi Valley, Calif.

Filed Oct. 22, 1996, Ser. No. 734,871

Int. Cl.[6] B41F *1/28*

U.S. Cl. 101—407.1 **8 Claims**



1. Apparatus for mounting a tubular core carrying a roll of web material of any width within a predefined range for feeding said web material from said roll along a web path having a defined centerline, said apparatus comprising:

a first roll holder having a contact face for engaging a first end of a tubular core;

a second roll holder having a contact face positioned opposite to said first contact face for engaging a second end of a tubular core;

reciprocal movement apparatus coupled to said first and second roll holders for causing each of said contact faces to linearly move away from said centerline in response to movement of the other of said contact faces away from said centerline for enabling a tuabular core of any width within said predefined range to be inserted between said contact faces to position said core symmetrically with respect to said centering; and

spring means for urging said roll holders toward said centerline for automatically engaging said roll holder contact faces against a tubular core inserted therebetween without requiring additional user intervention.

5,813,344

METHOD AND APPARATUS FOR REMOVING IMAGE FORMING SUBSTANCE FROM IMAGE HOLDING MEMBER

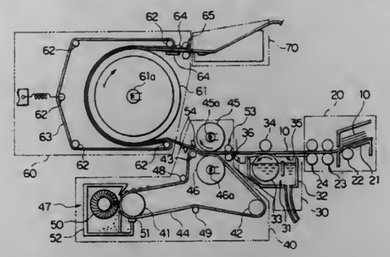
Tooru Maruyama, Fujisawa; Masatoshi Saitoh, Machida; Yasuhiro Takahashi, Tokyo, and Shigeru Fujita, Machida, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1995, Ser. No. 494,691

Claims priority, application Japan, Oct. 24, 1994, 6-284424; Jan. 9, 1995, 7-018548

Int. Cl.[6] B41F *35/00*

U.S. Cl. 101—424 **37 Claims**



1. A method for removing an image forming substance attached to a surface of an image holding member so that the image holding member may be reused, comprising the steps of:

supplying an unstabilizing liquid for unstabilizing a stable adhesive force between said image holding member and said image forming substance in a plurality of supply stages, a total amount of said unstabilizing liquid supplied in all of said unstabilizing liquid supply stages being a predetermined amount; and

separating said image forming substance from said image holding member in at least one separating step, wherein all said at least one separating steps comprise transferring said image forming substance unstabilized by said unstabilizing liquid supplied in said plurality of supply stages to a separating member, said separating member having adhesive force with respect to said image forming substance on said image holding member which is stronger than said unstabilized adhesive force between said image holding member and said image forming substance.

5,813,345

LITHOGRAPHIC IMAGING SYSTEM FOR INTERCHANGEABLE PLATE CYLINDERS

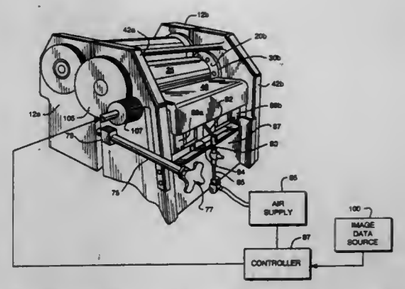
Douglas D. Fuller, Contoocook; Frank G. Pensavecchia, Hudson, both of N.H., and Lawrence J. Carme, Winchester, Mass., assignors to Presstek, Inc., Hudson, N.H.

Filed Sep. 9, 1996, Ser. No. 709,291

Int. Cl.[6] B41C *1/05*

U.S. Cl. 101—463.1 **21 Claims**

1. Apparatus for imaging a lithographic printing member having a width and a predetermined thickness, the apparatus comprising:



a. for supporting the printing member, a rotatable plate cylinder having an axial extent greater than the width of the printing member and having a selected diameter within a predetermined range;

b. peripheral contact surfaces associated with the plate cylinder and separated by a distance greater than the width of the printing member;

c. an imaging unit for placing a lithographic image onto the printing member;

d. a pair of rollers in fixed alignment with the imaging unit, the rollers being separated by a distance greater than the width of the printing member; and

e. means for controllably advancing the imaging unit toward the plate cylinder until the rollers meet the contact surfaces to thereby provide a predetermined spacing between the imaging unit and the printing member regardless of the selected cylinder diameter.

5,813,346

ADAPTIVE DRUM BALANCING SYSTEM

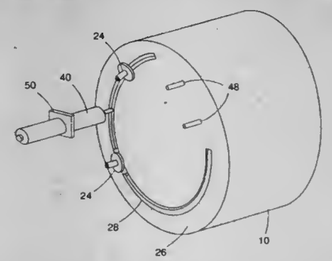
Yehuda Barnès Solomon, Rishon Lezion, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel

Filed Jul. 8, 1997, Ser. No. 889,901

Claims priority, application Israel, Aug. 22, 1996, 119116

Int. Cl.[6] F16F *5/22*

U.S. Cl. 101—483 **18 Claims**



1. A dynamically balanceable rotating drum system, comprising:

a fixed frame;

a cylindrical drum, rotatably mounted in said frame; and

at least one balancing set, each balancing set including:

a groove, fixedly associated with a face of said drum and formed along a circle, concentric with said drum;

at least one weight assembly, each weight assembly slideably mounted in said groove and including at least one moving engagement member, said moving engagement member normally moving in a circular path, concentric with said drum, when said drum rotates;

a weight mover, attached to said fixed frame, said weight mover including at least one fixed engagement member and being switchably operative to dispose any of said least one

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fixed engagement member in said circular path of a corresponding one of said at least one moving engagement member;

friction means between each of said at least one weight assembly and said groove, said friction means exerting on the corresponding weight assembly a circumferential frictional force, such that allows the weight assembly to slide along said groove, when said drum rotates and said fixed engagement member is disposed in said circular path of said corresponding moving engagement member, and such that keeps the weight assembly at any fixed position along said groove, otherwise.

5,813,347
DEVICE AND METHOD FOR CONTROLLING A PRINTING MACHINE, PARTICULARLY A FRANKING MACHINE DRUM

Hervé Baumann, Paris, France, assignor to SECAP, Boulgne-Billancourt, France

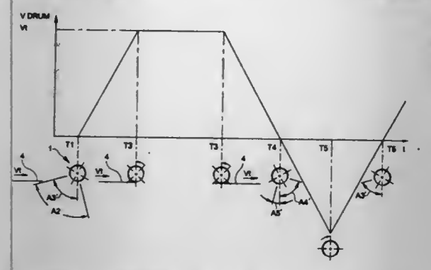
PCT No. PCT/FR96/00187, § 371 Date Dec. 13, 1996, § 102(e) Date Dec. 13, 1996, PCT Pub. No. WO96/26502, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 5, 1996, Ser. No. 750,892

Claims priority, application France, Feb. 20, 1995, 95 01919

Int. Cl.[6] B41J *1/32*

U.S. Cl. 101—486 **15 Claims**



3. Method of controlling a printing machine having a rotary drum (1), particularly for franking envelopes (4), of the type in which after each printing operation at constant rotation speed in a given direction the rotation speed of the drum (1) is decreased and, before each next printing operation, the rotation speed of the drum is increased in the same direction up to said constant speed, characterised in that the rotation direction of the drum (1) is reversed after reducing the rotation speed after each printing operation.

5,813,348
PRINT JOB ALLOCATION SYSTEM

Oded Zingher, Alzenau, Germany, assignor to Man Roland Druckmaschinen, Offenbach am Main, Germany

Filed Jun. 17, 1996, Ser. No. 664,424

Claims priority, application Germany, Jun. 17, 1995, 195 22 053.6

Int. Cl.[6] G06F *15/00*

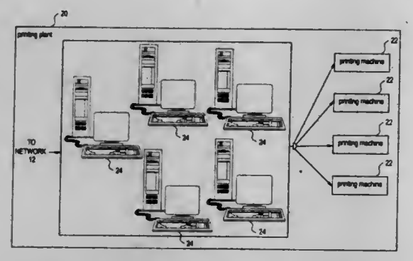
U.S. Cl. 101—494 **13 Claims**

1. A print job allocation system comprising:

a plurality of data input devices for allowing a plurality of printing plant customers to input print job requests and print job data concerning a requested print job;

a plurality of printing plants for printing the requested print job, each of the plurality of printing plants including a plurality of printing machines contained therein; and

a print job processor for receiving the print job requests and print job data from one of the plurality of printing plant



customers and selecting one of the plurality of printing machines contained within one of the plurality of printing plants to perform the requested print job based on at least one of a cost required to complete the requested print job, quality requirements of a requested print job, delivery requirements of a requested print job and transportation and distribution requirements for a requested print job.

5,813,349
TRANSPORT SYSTEM COMPRISING A DUAL-MODE VEHICLE AND PLATFORM LAYOUT FOR SAID SYSTEM

Palle Rasmus Jensen, Forhåbningsholms All´´30, Frederiksberg C, Denmark, 1904

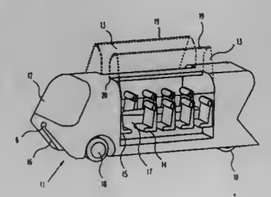
PCT No. PCT/DK95/00367, § 371 Date Mar. 12, 1997, § 102(e) Date Mar. 12, 1997, PCT Pub. No. WO96/08401, PCT Pub. Date Mar. 21, 1996

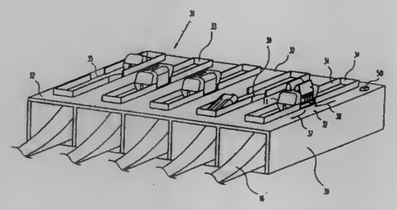
PCT Filed Sep. 14, 1995, Ser. No. 809,309

Claims priority, application Denmark, Sep. 14, 1994, 1052/94

Int. Cl.[6] B61B *1/00*

U.S. Cl. 104—28 **4 Claims**





1. A transport system comprising:

at least one dual-mode vehicle capable of driving on either a roadway or a railway having a cross-section, said vehicle including,

means for selectively powering the vehicle through an onboard battery or a railway;

a plurality of wheels for driving on a roadway;

means for driving on the railway, the railway driving means comprising a notch along the longitudinal direction of the vehicle, wherein the notch substantially corresponds to the cross-section of the railway;

a longitudinally extending row of seats positioned on either side of the notch; and

at least one door positioned on each side of the notch, to in turn, facilitate access to said longitudinally extending row of seats;

a platform arrangement comprising at least two platforms substantially positioned in parallel, each said platform including,

a roadway section including an upwardly extending ramp and a downwardly extending ramp, and a parking area between the upwardly and downwardly extending ramps, the parking area capable of accommodating at least one said dual-mode vehicle;

a passenger platform for retaining passengers for facilitated access to the at least one dual-mode vehicle, the passenger platform positioned proximate and above the parking area of the roadway section and elevated relative to the parking area of the roadway section;

a barrier positioned between the passenger platform and the roadway section, to, in turn prevent passengers from undesirably entering the roadway section , the barrier including an opening substantially corresponding to at least one of the doors of the dual-mode vehicle; and

at least one additional barrier positioned between with the roadway section and the passenger platform.

5,813,350
AMUSEMENT RIDE WITH TRACK

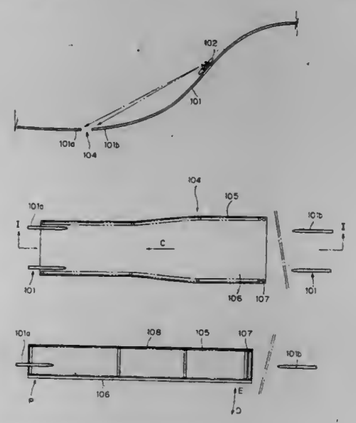
Yasushi Ochi, Izumisano, Japan, assignor to Oriental Sangyo, Ltd., Osaka, Japan

Filed Nov. 5, 1996, Ser. No. 744,256

Claims priority, application Japan, Aug. 12, 1996, 8-231444

Int. Cl.[6] A63G *21/00*

U.S. Cl. 104—54 **4 Claims**



1. An amusement ride comprising:

(a) a track;

(b) a break in the track defining a car releasing section, and a resumption of the track defining a car receiving section, wherein the break and the resumption define a missing portion of the track;

(c) a passenger car for traveling on the track, including (1) a car body, (2) a running wheel assembly connected to the car body, constructed to engage the track, to release the track at the car releasing section and to reengage the track at the car receiving section, and (3) a coasting wheel assembly connected to the car body; and

(d) a guide section for receiving the passenger car moving from the car releasing section and guiding the car to the car receiving section, including (1) a receiving plate disposed at least partly in said missing portion providing a surface for said coasting assembly to coast, and (2) guide rollers constructed to engage said car body and guide said running wheel assembly onto said car receiving section.

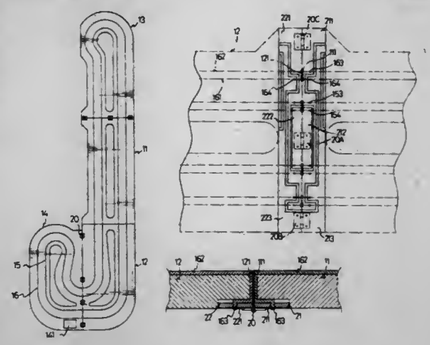
5,813,351
RACETRACK STRUCTURE

Yu-Bing Chen, 6th Fl., No.59, Sec. 4, Hsinyi Rd., Taipei, Taiwan

Filed Feb. 6, 1997, Ser. No. 796,819

Int. Cl.[6] A63G *31/00*

U.S. Cl. 104—60 **7 Claims**



1. Am improved racetrack structure comprising:

a closed loop with at least one lane, each lane being for a toy racing car to run therealong;

a control circuit for controlling the at least one lane so as to control the movement of said racing car on said at least one lane, said control circuit having a plurality of terminals;

wherein said closed loop is composed of a plurality of track sections, said track sections are engaged with each other by hinges, whereby said race track structure can be folded; each of two ends of each of said track sections has a PC board, each of said track sections has a plurality of conductors, two ends of each of said conductors are connected to said PC boards at the two ends of one of said track sections, respectively, the two PC boards of the adjacent ends of two adjacent ones of said track sections are electrically connected with each other via said hinges, and said conductors are electrically connected to said terminals of said control circuit respectively, thereby forming an electrical loop.

5,813,352
VENTED HATCH COVER

Kevin D. Bramlett, Mars Hill, and Michael W. DiLuigi, Asheville, both of N.C., assignors to Trinity Industries, Inc., Dallas, Tex.

Filed Oct. 28, 1996, Ser. No. 740,185

Int. Cl.[6] B65D *51/00*

U.S. Cl. 105—377.07 **26 Claims**

19. A railway hopper car comprising:

a plurality of hopper sections;

a roof covering at least one of the hopper sections;

at least one hatch opening extending through the roof and providing communication between an interior and an exterior of the at least one hopper section, the at least one hatch opening defined in part by a hatch coaming extending from a portion of the roof; and

a vented hatch cover disposed on the at least one hatch opening, the vented hatch cover comprising:

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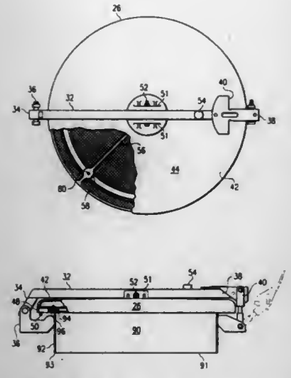
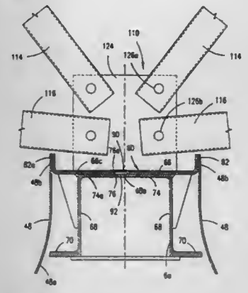


a plate member having an outer rim extending from a perimeter of the plate member, the plate member and outer rim defining an interior of the vented hatch cover; and

a filter assembly mounted on the interior of the vented hatch cover,

wherein the filter assembly comprises a generally planar filter and is positioned to permit air flow and out of the cover and hatch coaming and about entire perimeters of the cover and the hatch coaming.

5,813,353
GONDOLA RAILCAR
Lynn B. Sauter, Windber, Pa., assignor to Johnstown America Corporation, Chicago, Ill.
Filed Jan. 23, 1997, Ser. No. 786,920
Int. Cl.[6] B61D *17/00*
U.S. Cl. 105—406.1 **23 Claims**



1. A rail car comprising:

a pair of opposite truck assemblies;

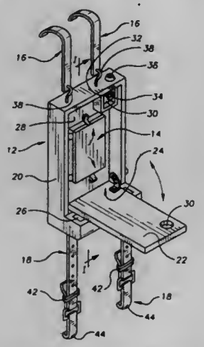
a body means being carried by said pair of opposite truck assemblies, said body means having a longitudinally extending center sill, wherein said center sill includes laterally extending portions;

a pair of longitudinally extending tubs being carried on opposite sides of said center sill, said tubs forming the floor of said body means;

a plate means affixed to said center sill, said plate means including a Pair of spaced, generally vertical portions which are positioned laterally of said center sill, wherein said tubs are attached to said vertical portions which are positioned laterally of said center sill to provide clearance of said tubs relative to said laterally extending portions of said center sill; and

an attachment means for attaching said pair of tubs to said vertical portions of said plate means.

5,813,354
VEHICLE SEATBACK TRAY ASSEMBLY
Richard H. Scott, 6516 Heritage Trace Ct., Mobile, Ala. 36695
Filed Dec. 17, 1997, Ser. No. 992,703
Int. Cl.[6] A47B *23/00*
U.S. Cl. 108—44 **16 Claims**



1. A vehicle seatback tray assembly comprising:

a main tray assembly;

a two-sided, two-way pivoting mirror assembly;

two user formable, upper attachment hooks; and

two adjustable length lower securing strap assemblies;

said main tray assembly including a main housing, a pivoting tray member and a tray member angular adjustment mechanism;

said main housing including a forward storage tray, a main housing compartment, a light compartment for housing a light bulb socket, and a light bulb socket controlling on/off switch;

said pivoting tray member being pivotally connected to said main housing and including a light opening that pivots over said light compartment of said main housing when said pivoting tray member is pivoted into a closed position blocking access into said main housing compartment;

said angular adjustment mechanism being connected between said pivoting tray member and said main housing;

said two-sided, two-way pivoting mirror assembly being positioned within said main housing compartment and including a two-sided mirror, a first and a second pivot bar, a first and a second pivoting strip connector, and first and second pull straps;

said first and said second pivot bar each being U-shaped and secured at ends of thereof to a main-housing compartment defining wall of said main housing;

said first and second pivoting strip connectors each being permanently secured to an inwardly directed mirror surface of said two-sided mirror;

each of said first and second pivoting strip connectors including a pivot bar insertion opening along an entire length thereof that is defined between two resilient wall sections that further define a resilient pivot bar gripping structure;

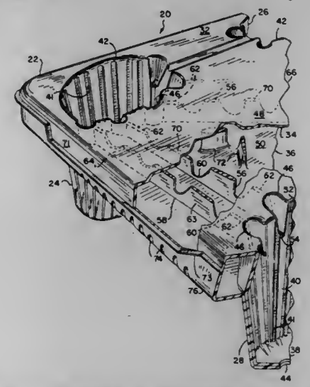
said first and second pivoting strip connectors being spaced apart a distance sufficient to allow said first pivot bar to be positioned within said resilient pivot bar gripping structure of said first pivoting strip connector while said second pivot bar is positioned within said resilient pivot bar gripping structure of said second pivoting strip connector;

each of said resilient pivot bar gripping structures having sufficient gripping strength against a respective said pivot bar to independently hold said two-sided mirror in a user set pivot position;

each of said two user formable, upper attachment hooks being constructed from a user bendable strip and secured to said main tray assembly with a securing eye-bolt;

said two adjustable length lower securing strap assemblies each including an adjustable length strap provided with an under-seat attachment hook at one end thereof and attached to said main housing at a second strap end thereof.

5,813,355
TWIN-SHEET THERMOFORMED PALLET WITH HIGH STIFFNESS DECK
Henry F. Brown, Portage, and Dennis A. Giannini, Poynette, both of Wis., assignors to Trienda Corporation, Portage, Wis.
Continuation of Ser. No. 515,288, Aug. 15, 1995, Pat. No. 5,566,624. This application Oct. 21, 1996, Ser. No. 729,643
Int. Cl.[6] B65D *19/38*
U.S. Cl. 108—53.3 **13 Claims**



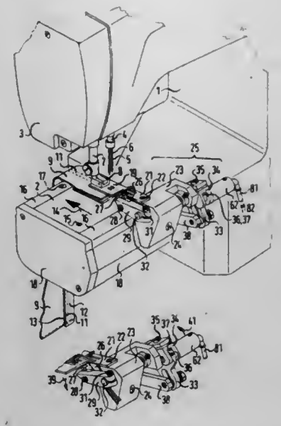
1. A twin-sheet thermoformed thermoplastic pallet, comprising:

a) a load-bearing deck formed of a first sheet of thermoplastic material defining a plane and a second sheet of thermoplastic material fused to the first sheet in selected locations; and

b) at least four feet arrayed in a rectangular array, each foot being a downwardly protruding portion of each of said first and second sheets joined together at a terminating foot floor, wherein between each foot of the array and every other of said four feet is defined a deck portion, each said deck portion being reinforced by at least one rib structure extending across said deck portion and between each of said legs, and wherein each rib is defined by at least four pockets arrayed to form the extending rib, the pockets fusing a portion of said second sheet to said first sheet at approximately the plane defined by the first sheet the pockets being elongated in a direction the ribs extend, and wherein at least two of said pockets are joined by an upstanding solid web formed in said second sheet.

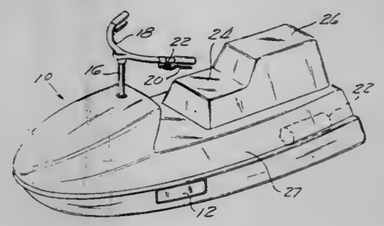
5,813,356
SEWING MACHINE WITH TRIMMING DEVICE
Wolfgang Nolle, Albstadt, Germany, assignor to Union Special GmbH, Hemmingen, Germany
Filed Mar. 24, 1997, Ser. No. 826,087
Claims priority, application Germany, Mar. 20, 1996, 296 15 135.7
Int. Cl.[6] D05B *37/06;69/02*
U.S. Cl. 112—122 **7 Claims**

1. A sewing machine of the type including a drive shaft and other sewing machine components, a cutting means comprising a



fixed lower cutter including a cutting edge and a movable, hook shaped, upper cutter including a cutting edge, said movable upper cutter is disposed when in a working position adjacent to said lower cutter and movable in a path that causes its cutting edge to raise above and cross the cutting edge of said fixed lower cutter, and which upper cutter is drivingly connected to said drive shaft of the sewing machine for the purpose of trimming a workpiece edge of a folded seam, characterized in that a disengaging means is provided between said drive shaft and said upper cutter, said disengaging means functioning, upon being actuated, to move the upper cutter out of its working position into an inoperative position at which its path of movement never causes its cutting edge to raise above and cross the cutting edge of said fixed lower cutter.

5,813,357
JET SKI STEERING AND BRAKING SYSTEM
Steven R. Watson, 2152 Liane, Santa Ana, Calif. 92705
Filed Jul. 31, 1997, Ser. No. 904,079
Int. Cl.[6] B63H *25/44*
U.S. Cl. 114—145 R **7 Claims**



1. A jet ski steering and braking system comprising:

flap means having portions on either side of the jet ski in sealed compartments located beneath the waterline at operating speeds of the jet ski;

means to operatively connect the flap means so as to permit uniform or independent movement of the flap means;

steering means connected to said means to operatively connect the flap means, said steering means including operable brake means; and

safety means to maintain uniform extension of the flap means in the absence of operation of said braking means, said safety means rendering the steering means inoperable to independently move portions of the flap means.

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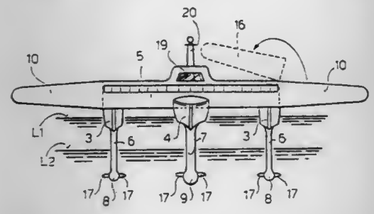
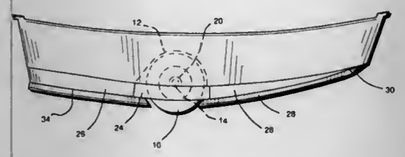
5,813,358
SURFACE-PIERCING SURFACE EFFECT MARINE CRAFT
Sabino Roccotelli, Via Val Maira 115, 00141 Roma, Italy
PCT No. PCT/EP95/02448, § 371 Date Feb. 19, 1997, § 102(e) Date Feb. 19, 1997, PCT Pub. No. WO96/00164, PCT Pub. Date Jan. 4, 1996
PCT Filed Jun. 23, 1995, Ser. No. 750,557
Claims priority, application Italy, Jun. 24, 1994, MI94A3126
Int. Cl.[6] B63B *1/16*
U.S. Cl. 114—272 10 Claims



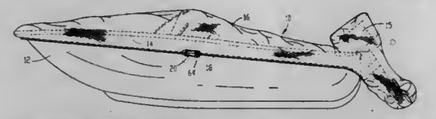
1. A marine or naval craft for traveling at a service speed, comprising:
a load platform including a portion for receiving a load;
two lateral and one central trimaran hulls that support the load platform;
a ventral fin projecting from a bottom portion of each of the trimaran hulls; and
immersible bodies for achieving propulsion and for obtaining attitude control;
the load receiving portion of the load platform has a vertical longitudinal cross-section that is suitable for producing an aerodynamic lift when traveling at the service speed, wherein at the service speed, substantially all of the weight of the craft is supported primarily by the aerodynamic lift and immersed parts of the craft are reduced to a bare minimum for achieving the propulsion and the attitude control.

5,813,359
ROWBOAT WITH PERMANENT SUBMERSIBLE WHEELS
Fletcher G. Hall, 16 Beach Ave., Salem, Mass. 01970
Filed Jan. 28, 1997, Ser. No. 789,795
Int. Cl.[6] B63C *13/00*
U.S. Cl. 114—344 8 Claims



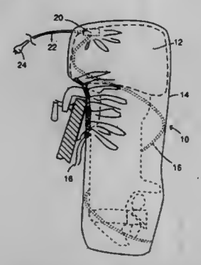
1. A watercraft having a hull with a bottom and a longitudinal axis, the watercraft comprising at least one skeg formed on the bottom of said hull, each said skeg extending substantially from bow to stem therof, and having a discontinuity formed at approximately amidships, one non-retractable wheel associated with each said skeg, and mounted at said discontinuity and extending from a wheel well formed in the bottom of the hull, each said wheel well and each said wheel being aligned with its associated skeg, and said wheel generally forming a continuation of said skeg across said discontinuity.

5,813,360
LOCKING VEHICLE COVER
Steven R. Dickey, Jr., 9350 Russell St., Overland Park, Kans. 66212
Filed Mar. 10, 1997, Ser. No. 814,632
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—361 21 Claims



1. A vehicle cover apparatus comprising:
a sheet of flexible material configured for covering and protecting at least the upper portion of a vehicle, said sheet presenting a circumscribing edge, the vehicle presenting a first periphery and a second periphery greater than and above said first periphery;
a securing band coupled with said sheet adjacent said edge; and
a tightener including a pair of band-engaging components respectively coupled to individual portions of said band, and a handle operatively coupled to said components and movable about an axis for selectively shifting said band between a tightened condition in which said band would tightly encompass the vehicle at said first periphery, and a relaxed condition in which said band could be slipped over said second periphery, said tightener including means for holding said band in said tightened condition, said tightened condition being sufficient for preventing slipping of said band over said second periphery.

5,813,361
BOAT MOTOR HEATER
John G. Milliman, 6223 Pasture Dr., Castle Hayne, N.C. 28429
Filed Apr. 30, 1997, Ser. No. 846,275
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—361 13 Claims

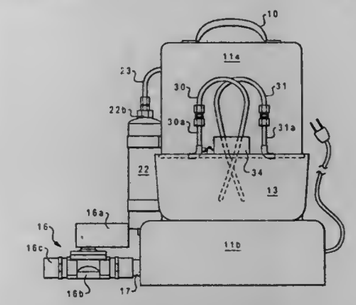


1. A protective cover for a boat motor attached to the transom of a boat comprising:
a) a flexible, bag-shaped covering having a neck, the covering forming a cavity for enclosing said motor, the covering having an interior wall;
b) a closure attached to the covering at the neck, the closure being adapted to secure the neck adjacent the transom;
c) a heating element within the covering; and
d) a control means for activating the heating element when the temperature within the cavity is below a predetermined temperature.

5,813,362

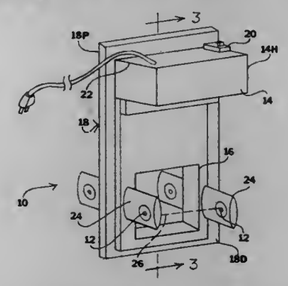
Patent Not Issued For This Number

5,813,363
AUTOMATIC LIQUID DISPENSER FOR ANIMALS
David A. Snelling, 3316 Caribbean Dr., Mesquite, Tex. 75150-1717
Filed Jun. 9, 1997, Ser. No. 871,342
Int. Cl.[6] A01K *7/00*
U.S. Cl. 119—73 20 Claims



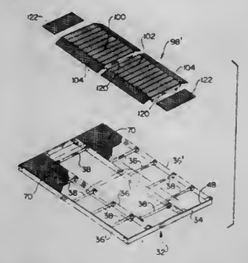
1. An automatic liquid dispenser for animals comprising:
(a) a fluid receptacle having an intake and a drain;
(b) intake valve control means including
(i) an intake valve connected to said intake and
(ii) first control means connected to said intake valve and including a liquid level sensor and time delay device for controllably operating said intake valve; and
(c) drain valve control means including
(i) a drain valve connected to said drain and
(ii) second control means connected to said drain valve and including automatic means for opening and closing said drain valve during selected periods of time.

5,813,364
AUTOMATIC PET DOOR HOUSING
Charles Harrison, 6001 Wrigley Way, Ft. Worth, Tex. 76133
Filed May 9, 1997, Ser. No. 853,200
Int. Cl.[6] E06B *5/00*
U.S. Cl. 119—501 3 Claims



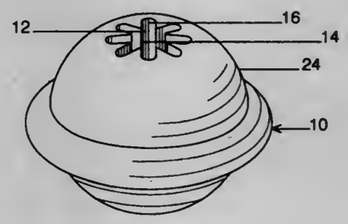
1. An automatic pet door housing, having a proximal end and a distal end, comprising:
a door, located at the distal end of the housing, having a top portion and a bottom portion;
two arms located at the distal end extending perpendicular to the housing, one arm located on either side of the door;
two sensors positioned at the distal end of the housing, one sensor on each arm located directly across from each other;
a motor, contained within a motor housing located at the proximal end of the housing;
a worm gear driven by the motor, enmeshed with teeth along the top portion of the door, that opens and closes the door; and
a power supply that is in conjunction with the motor and supplies constant power to said motor.

5,813,365
MODULAR FLOORING SYSTEM
Nashat N. Helmy, Golden Valley, Minn., assignor to Tandem Products, Inc., Minneapolis, Minn.
Filed Mar. 6, 1997, Ser. No. 812,567
Int. Cl.[6] A01K *1/015*
U.S. Cl. 119—528 18 Claims



1. An animal shelter modular flooring system, comprising:
(a) a base frame having a pair of end crossbars, a plurality of longitudinally extending support members extending generally transverse to said end crossbars, and interconnecting elements extending generally transverse to said support members;
(b) a first panel removably supported on said base frame and defining a first plane;
(c) a second panel removably supported on said base frame and including a portion, on which an animal mother is disposed during feeding of its young, positioned to define a second plane, elevated above said first plane and generally parallel thereto, and a ramp portion angling downward from said second plane defining portion of said second panel toward said first panel; and
(d) means for locating said first and second panels on said frame in desired positions relative to one another.

5,813,366
ANIMAL TOY
William David Mauldin, Jr., 1807 Grove St., Sarasota, Fla. 34239
Filed Jan. 23, 1997, Ser. No. 786,866
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—710 11 Claims



1. A non-consumable animal toy comprising:
a three-dimensional body formed of substantially solid resilient material:
said body having a gripping shaft formed centrally through said body and open at each end thereof, said gripping shaft includ-

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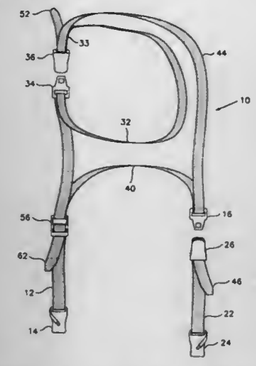
ing spaced flexible splines which are substantially coextensive with said gripping shaft and which cooperatively act to resiliently receive and hold a small quantity of animal food or attractant whereby the animal food or attractant is accessible for consumption or sensory detection, respectively, by an animal from each said open end of said gripping shaft.

5,813,367
CHILD SAFETY HARNESS
Larry Dale O'Brien, #1210, 1175 Douglas Street, Victoria, B.C., Canada, V8W2E1
Filed Jan. 29, 1996, Ser. No. 593,428
Int. Cl.[6] A62B *35/00*
U.S. Cl. 119—770 **15 Claims**



1. A child safety harness for use in an aircraft or other vehicle having anchor points for a seat belt, the child safety harness comprising:

a first belt having first and second ends, the first end terminating in a first connector for connection to an anchor point and the second end terminating in a male member of a first buckle;

a second belt having third and fourth ends, the third end terminating in a second connector for connection to an anchor point and the fourth end terminating in a female member of the first buckle;

the first and second belts together forming a seat belt for securing an adult;

a third belt suitable for securing a child, the third belt having fifth and sixth ends, the fifth end terminating in a male member of a second buckle and the sixth end terminating in a female member of the second buckle; and

interconnecting means securing the third belt to the adult seat belt.

5,813,368
HAND-HELD DOG RESTRAINT
Harvey Rasmussen, 53 W. Pacific, #17, Henderson, Nev. 89105
Filed Jul. 1, 1997, Ser. No. 886,367
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—799 **16 Claims**

1. A hand-held dog restraint comprising:

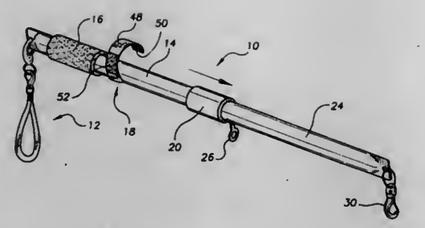
a rigid upper restraint bar;

a user positionable wrist loop assembly securable to an upper end of said upper restraint bar;

a rigid lower restraint bar;

a dual pivot hinge assembly pivotally secured between said upper and lower restraint bars;

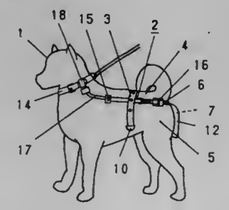
a sliding locking tube slidable into a locking position covering portions of said rigid upper restraint bar, said rigid lower restraint bar and said dual pivot hinge assembly;



a wrist loop securing bracket extending from said lower restraint bar and having a securing structure to which said wrist loop assembly is securable; and

a strap assembly that is securable about said upper rigid restraint bar and said lower rigid restraint bar to secure said hand-held dog restraint in a collapsed configuration.

5,813,369
DEVICE FOR TAKING CARE OF A DOG'S DUNG
Jiro Fujinaga, 18-12 Aza-Hageyama Myohouji Suma-ku, Kobe-shi Hyogo, Japan
Filed Jul. 7, 1997, Ser. No. 888,922
Claims priority, application Japan, Sep. 5, 1996, 8-257584
Int. Cl.[6] A01K *23/00*
U.S. Cl. 119—868 **10 Claims**



1. A device for taking care of a dog's dung comprising:

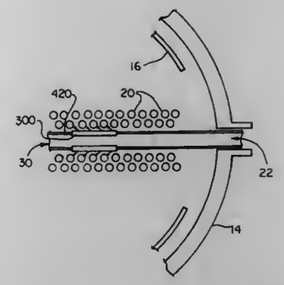
a harness which can be mounted easily removably on a dog by being pushed from the dog's back onto the dog's waist or hips, the harness which can be mounted to a dog's waist or hips including a hold member, the hold member being shaped like an inverse U opening downward, the hold member being adapted to be mounted on a dog's waist or hips from the dog's back, the hold member having a predetermined clamping force for clamping with a predetermined elasticity, the hold member being fitted with a connector to a dog's collar, so that the harness is not dislocated; and

a dung bag fitted to the harness in such a manner that the bag faces the dog's anus.

5,813,370
STEAM GENERATOR LANCING SYSTEM
George V. Owen, Forest, Va., and Scott M. Theiss, Lake Lure, N.C., assignors to Franatome Technologies Inc., Lynchburg, Va.
Filed Sep. 28, 1995, Ser. No. 535,570
Int. Cl.[6] F22B *37/48;* **F28G** *9/00*
U.S. Cl. 122—382 **17 Claims**

1. A lancing system for cleaning tubes and tubesheets of a steam generator, said lancing system comprising:

(a) a nozzle block including at least one nozzle adapted for fluid communication with a high pressure hose, said nozzle block including:



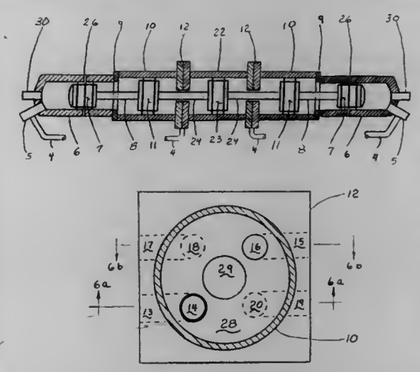
(i) a frame; (ii) a rigid, one-piece nozzle body mounted in said frame for rotation with respect to said frame about a rocker axis, said nozzle body including an inlet connectable with the high pressure hose for fluid communication therewith; and (iii) a nozzle mounted in said nozzle body, said nozzle in fluid communication with said inlet, said nozzle block further including a guide having a slot formed therein for receiving said nozzle and maintaining said nozzle at a preselected angle of between about 30° and 150° with respect to said rocker axis;

(b) support means including a carrier for transporting said nozzle block through the steam generator;

(c) a control system connected to said nozzle block and operative to selectively position said nozzle with respect to the tubes and tubesheets in the steam generator; and

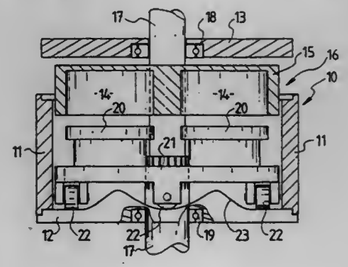
(d) rocker means operable to rotate said nozzle about said rocker axis.

5,813,371
COMPUTERIZED INTERNAL SUPERCHARGED ENGINE-PUMP
George Keith Peel, 1901 S. First St., Temple, Tex. 76504
Filed Nov. 4, 1996, Ser. No. 740,734
Int. Cl.[6] F02B *71/04*
U.S. Cl. 123—46 R **3 Claims**



1. An internal combustion engine comprising a pair of aligned engine powerheads and having a common double acting pump therebetween; each said engine powerhead including a power cylinder and a supercharger cylinder; each of said power cylinders, said supercharger cylinders and said double acting pump having a respective piston; all of said pistons reciprocating along a common longitudinal axis of said aligned engine powerheads and each fixed to a power rod assembly for simultaneous actuation; a respective common manifold assembly being juxtaposed between each of said engine powerheads and said common double acting pump; each said common manifold having a valve assembly providing isolated flow into and out of a respective side of the double acting pump and isolated flow into and out of the associated supercharger cylinder; the isolated flow displaced by each associated supercharger is lead to a respective power cylinder and the isolated flow displaced by the double acting pump is used to perform work.

5,813,372
AXIAL PISTON ROTARY ENGINE
Steven Charles Manthey, Currumbin Valley, Australia, assignor to Advanced Engine Technology Pty Ltd., Burleigh Gardens, Australia
PCT No. PCT/AU95/00815, § 371 Date Oct. 24, 1996, § 102(e) Date Oct. 24, 1996, PCT Pub. No. WO96/17162, PCT Pub. Date Jun. 6, 1996
PCT Filed Dec. 4, 1995, Ser. No. 737,056
Claims priority, application Australia, Dec. 2, 1994, PM 9827
Int. Cl.[6] F02B *57/00*
U.S. Cl. 123—43 A **20 Claims**



1. A rotary internal combustion engine of the type having pistons mounted for reciprocatory movement in respective cylinders which are arranged in equally-spaced relationship around a longitudinal axis of rotation, said axis being the axis of rotation of an output shaft passing rotatably and sealably through apertures of respective first and second end plates of a housing within which the pistons and cylinders move as part of a rotatable rotor assembly secured to said output shaft, while the pistons are simultaneously movable reciprocably in the cylinders, first cam follower means being associated with each piston and adapted to coact with undulating first cam track means around the housing, means being provided for conveying combustible fuel to, and for conveying exhaust gases from the operative ends of the bores of the cylinders whereby cyclical combustion of said fuel in said bores imparts reciprocation to the pistons with resultant thrust against the first cam track means so as to cause rotation of the rotor assembly and output shaft, the pistons including two sets thereof each having at least two pistons, the pistons of each set being spaced about the axis of rotation of the rotor assembly and output shaft and being interconneceted by piston-connection means so that the pistons of each set move in unison, the cam follower means and the undulating first cam track means being arranged so that movement of one set of pistons in their respective cylinders is generally in the direction opposite to the direction of movement of the other set of pistons; characterized in that the first cam follower means engage non-captively with the first cam track means.

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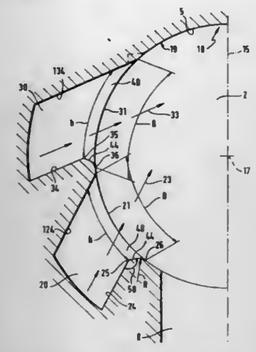
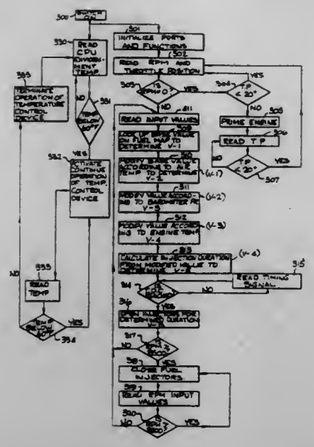
5,813,373
TWO-STROKE INTERNAL COMBUSTION ENGINE WITH FLUSHING CHANNELS

Jörg Schlossarczyk, Winnenden; Axel Klimmek, Schwalkheim, and Peter Pretzsch, Schorndorf, all of Germany, assignors to Andreas Stihl AG & Co., Waiblingen, Germany

Filed May 7, 1997, Ser. No. 852,680
Claims priority, application Germany, May 7, 1996, 196 18 266.2
Int. Cl.[6] F02B *33/04*
U.S. Cl. 123—65 P **14 Claims**





1. A two-stroke internal combustion engine for a hand-guided working tool, said engine comprising:

a cylinder having a cylinder wall;

a piston reciprocating in said cylinder and defining with said cylinder wall a combustion chamber;

transfer parts, each having an outlet window, for introducing combustion air and fuel into said combustion chamber;

said outlet windows cut into said cylinder wall for connecting said transfer parts to said combustion chamber;

said outlet windows having limiting edges extending parallel to a central cylinder axis of said cylinder and located within an inner mantle surface of said cylinder wall;

said outlet windows having a window width measured in a circumferential direction of said inner mantle surface;

said transfer parts having a channel width measured in said circumferential direction of said inner mantle surface;

said window width being greater than said channel width;

said transfer parts having a transition portion into said outlet windows;

said transfer parts having a flow stall edge at an end of said transition portion remote from said outlet windows;

said flow stall edges extending parallel to said central cylinder axis of said cylinder;

wherein said flow stall edges are formed by two abutting surfaces positioned at an angle of less than 120° to one another.

5,813,374
TWO-CYCLE ENGINE WITH ELECTRONIC FUEL INJECTION

Ronald E. Chasteen, Colorado Springs, Colo., assignor to Injection Research Specialists, Inc., Colorado Springs, Colo.

Continuation of Ser. No. 836,795, Feb. 18, 1992, Pat. No. Re. 34,803, which is a continuation of Ser. No. 119,626, Nov. 12, 1987, abandoned. This application Dec. 5, 1994, Ser. No. 341,193
Int. Cl.[6] F02B *33/04*
U.S. Cl. 123—73 C **6 Claims**

1. A fuel injection system for a two-stroke cycle engine of the type comprising at least one cylinder, a crankcase associated with said cylinder, a piston reciprocally mounted in said cylinder and crankcase; a reciprocally openable and closable crankcase inlet for enabling combustible fluid to be drawn into the crankcase, a reciprocally openable and closable transfer port for transferring combustible fluid compressed in said crankcase to said cylinder, an ignition system for igniting compressed combustible fluid in said cylinder, a reciprocally openable and closable exhaust port in said cylinder for enabling exhaust of burned combustible fluid from said cylinder, a crankshaft connected to said piston for transferring mechanical energy from said piston to a drive unit, and an electrical energy supply source including a battery for operating the ignition system and other electrical components, comprising:

a) a fuel injector for injecting fuel to a manifold for combustion within said cylinder;

b) a fuel pump for supplying fuel to said fuel injector;

c) an air temperature sensor for providing a signal indicative of ambient air temperature;

d) an engine speed sensor for providing a signal indicative of a speed of revolution of said engine;

e) a timing sensor for providing a signal indicative of engine timing;

f) a barometric pressure sensor for providing a signal indicative of atmospheric air pressure;

g) a throttle position sensor for providing a signal indicative of an amount of opening of an engine throttle valve;

h) an engine temperature sensor for providing a signal indicative of engine temperature;

i) a look-up table of experimentally determined base fuel injection values at predetermined standard operating conditions is stored according to engine revolution speed and throttle valve opening amount for the two-stroke cycle engine to be fuel-injected; and

j) a processor executing a program performing the following functions:

1) turning said fuel pump on and off,

2) receiving the engine revolution speed signal and the throttle valve opening amount signal, and retrieving a corresponding base fuel injection value from said experimentally determined look-up table,

3) receiving the ambient air temperature signal and calculating an air temperature modification value of the base fuel injection value,

4) receiving the atmospheric air pressure signal and calculating a barometric pressure modification value of the base fuel injection value,

5) receiving the engine temperature signal and calculating an engine temperature modification value to the base fuel injection value,

6) determining a total fuel injection value from the base fuel injection value, the air temperature modification value, the barometric pressure modification value, and the engine temperature modification value,

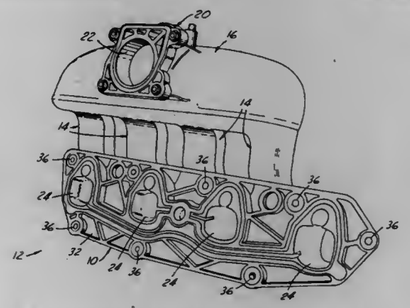
7) determining an injector open duration interval based upon the total fuel injection value and a known fuel output rate capacity of said fuel injector, and

8) generating a control signal for opening said fuel injector for the determined injector open duration interval in response to the engine timing signal.

5,813,375
METHOD AND SYSTEM FOR DISTRIBUTING VAPORS OR GASES TO EACH CYLINDER OF A MULLTICYLINDER ENGINE

Alan R. Taylor, Clarkson, Mich., assignor to Siemenselectronic Limited, Windsor, Canada

Filed Mar. 11, 1996, Ser. No. 613,565
Int. Cl.[6] F02M *35/10*
U.S. Cl. 123—73 A **8 Claims**



1. In an internal combustion piston engine having an engine block and cylinder head defining a plurality of cylinders and an intake manifold for directing air inducted into said cylinders, said intake manifold having a mounting flange with a face secured against said engine, the improvement comprising:

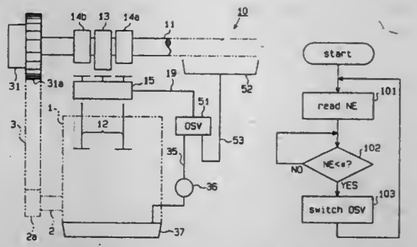
an auxiliary fluid distribution system for directing a flow of an auxiliary fluid generated during operation of said engine into said engine cylinders, said auxiliary fluid distribution system including a first network of individual flow passages each extending to an intake port of a respective engine cylinder, and means for directing said auxiliary gaseous fluid into said first network of individual passages, said first network of flow passages comprising a series of grooves recessed into said intake manifold mounting flange so as to define said individual passages with said manifold face positioned against said engine.

5,813,376
APPARATUS FOR SUPPLYING OIL IN ENGINE

Yuichi Sakaguchi, Nagoya; Hiroyuki Kawase, Okazaki; Koichi Shimizu, Toyota; Yuuji Yoshihara, Toyota, and Hiromasa Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 23, 1997, Ser. No. 936,108
Claims priority, application Japan, Sep. 24, 1996, 8-251759
Int. Cl.[6] F02D *13/02;* **F01L** *1/34;13/00*
U.S. Cl. 123—90.16 **20 Claims**

1. An apparatus for supplying lubricant oil to an engine, said engine having a crankshaft, a combustion chamber, a valve that selectively opens and closes the combustion chamber, wherein said valve has a lift characteristic, a control device for altering the lift characteristic according to a change of hydraulic pressure therein, and a lubricant passage connected with the a first supplying means to supply oil to a mechanism within the engine, said apparatus comprising:



a hydraulic pressure passage extending into an interior of the control device to exchange the hydraulic pressure with the control device, whereby said control device is actuated to alter the lift characteristic;

said first supplying means being arranged to supply the oil to the pressure passage when connected with the pressure passage;

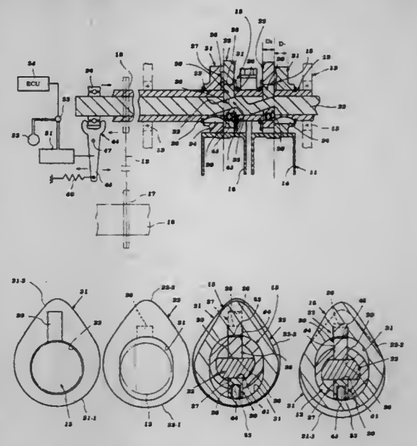
a second supplying means for auxiliarily supplying the oil to the pressure passage when connected with the pressure passage; and

selecting means for selecting one of the two supplying means to connect the selected supplying means with the control device based on the engine speed.

5,813,377
ENGINE VALVE OPERATING SYSTEM

Nobuhiko Matsunaga, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 5, 1996, Ser. No. 744,056
Claims priority, application Japan, Nov. 7, 1995, 7-288660
Int. Cl.[6] F01L *13/00*
U.S. Cl. 123—90.17 **13 Claims**



1. A valve-actuating mechanism for a reciprocating machine comprised of a camshaft journaled for rotation by said machine and driven in timed relationship with said machine, a first cam fixed upon said camshaft and rotatable with said camshaft, a second cam fixed for rotation with said camshaft and moveable relative to said first cam in a direction radial to the axis of rotation of said camshaft, said first cam and said second cam being juxtaposed to each other for actuating said valve trough the same element, said first and said second cams being interlocked for simultaneous rotation with said camshaft through a direct keyed relationship between sad first cam and said second cam that main-

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tains a constant driving relationship between said first cam and said second cam regardless of the radial position of said second cam, said direct keyed relationship being provided by a radial groove formed in the face of said first cam adjacent said second cam and a key on said second cam extending into said radial groove, and mean for controlling the radial position of said second cam so that either said first cam or said second cam is operative to actuate said valve.

5. A valve-actuating mechanism for a reciprocating machine comprised of a tubular camshaft journaled for rotation by said machine and driven in timed relationship with said machine, a first cam comprised of a lobe and an integral base circle portion fixed upon said camshaft and rotatable with said camshaft, a second cam comprised of a lobe and an integral base circle portion fixed for rotation with said camshaft and moveable relative to said first said cam in a direction radial to the axis of rotation of said camshaft, said first cam and said second cam being juxtaposed to each other for actuating said valve through the same element the base circle of said cams being such that the base circle of said first cam is greater than the base circle of said second cam, and a cam actuating shaft positioned within the tubular interior of said tubular camshaft for controlling the radial position of said second cam so that the lobes of either said first cam or said second cam is operative to actuate said valve.

5,813,378

VALVE TIMING CONTROL DEVICE

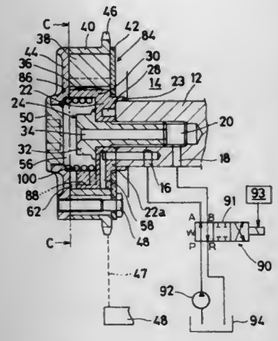
Atsushi Sato, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi-pref., Japan

Filed Jul. 11, 1997, Ser. No. 893,481

Claims priority, application Japan, Jul. 11, 1996, 8-182253

Int. Cl.[6] F01L *1/344*

U.S. Cl. 123—90.17 **10 Claims**



1. A valve timing control device comprising:

a rotor fixed on a cam shaft and having a circular groove opposing to an end surface of the cam shaft, the circular groove communicating to a passage formed in the cam shaft,

a housing member disposed so as to surround the rotor,

an angular phase converting mechanism disposed between the rotor and the housing member so as to be able to transmit the rotational torque from the housing member to the rotor and so as to be able to give the angular phase difference between the rotor and the housing member and

fluid supplying means for supplying fluid under pressure to the angular phase converting mechanism through the passage and the circular groove.

5,813,379

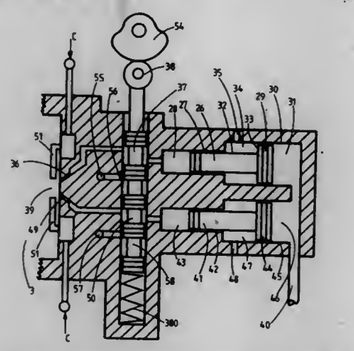
DISPLACER JET IGNITER

Joseph Carl Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Jan. 3, 1995, Ser. No. 368,093

Int. Cl.[6] F02P *23/00*

U.S. Cl. 123—143 B **7 Claims**



1. In a piston internal combustion engine comprising: at least one combined means for compressing and expanding gases, each said combined means comprising: an internal combustion engine mechanism comprising a variable volume chamber for compressing and expanding gases, and drive means for driving said internal combustion engine mechanism and varying the volume of said chamber through repeated cycles;

each said variable volume cycle comprising a compression time interval, when said variable volume is sealed and decreasing, followed by an expansion time interval, when said variable volume is sealed and increasing, these two time intervals together being a compression and expansion time interval;

each said combined means for compressing and expanding further comprising, intake means for admitting reactant gases into said variable volume chamber prior to each said compression time interval, exhaust means for removing reacted gases from said variable volume chamber after each said expansion time interval;

each said variable volume cycle further comprising an exhaust time interval, when said variable volume is opened to said exhaust means, followed by an intake time interval when said variable volume is opened to said intake means, these two time intervals being an exhaust and intake time interval; said exhaust and intake time interval following after a preceding expansion time interval and preceding a next following compression time interval; said piston internal combustion engine further comprising a source of supply of reactant gas containing appreciable oxygen gas to each said intake means for admitting reactant gases into said variable volume chamber; said piston internal combustion engine further comprising a source of principal gaseous engine fuel and means for delivering said principal gaseous engine fuel into said variable volume chamber; each cycle of said variable volume chamber further comprising a potential combustion time interval comprising that portion of said compression and expansion time interval during which principal gaseous engine fuel and reactant gas containing appreciable oxygen gas are both present within said variable volume chamber; each cycle of said variable volume chamber further comprising a burning time interval during which the mixture of principal gaseous engine fuel and reactant gas containing appreciable oxygen gas is ignited and burned;

wherein the improvement comprises adding to said piston internal combustion engine at least one displacer jet igniter for each said variable volume chamber of said piston internal combustion engine, each said displacer jet igniter comprising:

a source of air vent pressure;

air displacer means for compressing and displacing air and comprising: an air displacer piston sealably operative within a

displacer cylinder and said displacer piston and cylinder enclosing an air displacer volume; an air driver piston sealably operative within a driver cylinder and said driver piston and cylinder enclosing an air driver volume;

said air driver piston side opposite said air driver volume side being connected to said air displacer piston side opposite said air displacer volume side and the vented volume thusly enclosed between said driver piston and said displacer piston being vented to said air vent pressure source; said driver piston area being larger than said displacer piston;

an air release valve and air release valve drive means and an air release valve inlet and an air release valve outlet;

an air release orifice comprising an air release orifice inlet and an air release orifice outlet;

said air release valve inlet being connected to said air displacer volume of said air displacer means, and said air release valve outlet being connected to said air release orifice inlet;

a source of fuel vent pressure;

igniter fuel displacer means for pressurizing and displacing igniter fuel and comprising: an igniter fuel displacer piston sealably operative within a displacer cylinder and said displacer piston and cylinder enclosing an igniter fuel displacer volume; an igniter fuel driver piston sealably operative within a driver cylinder and said driver piston and cylinder enclosing an igniter fuel driver volume; said igniter fuel driver piston side opposite said igniter fuel driver volume side being connected to said igniter fuel displacer piston side opposite said igniter fuel displacer volume side, and the vented volume thusly enclosed between said driver piston and said displacer piston being vented to said fuel vent pressure source; said driver piston area being larger than said displacer piston area;

an igniter fuel release valve and igniter fuel release valve drive means and an igniter fuel release valve inlet and an igniter fuel release valve outlet;

an igniter fuel release orifice comprising an igniter fuel release orifice inlet and an igniter fuel release orifice outlet;

said igniter fuel release valve inlet being connected to said displacer volume of said igniter fuel displacer means, and said igniter fuel release valve outlet being connected to said igniter fuel release orifice inlet;

a mixing volume portion of said variable volume chamber;

said air release orifice outlet and said igniter fuel release orifice outlet connecting into said mixing volume portion and these two outlets being aligned so that air and igniter fuel flowing therethrough will be mixed together to create an air fuel mixture within said mixing volume;

a primary ignition means for igniting air fuel mixtures created from said igniter fuel within said mixing volume and operative during at least the first portion of each said burning time interval, and comprising energizer means for energizing said primary ignition means;

release interdrive means for driving said air release valve drive means, said energizer means of said primary ignition means, and said igniter fuel release valve drive means from said drive means for driving said internal combustion engine mechanism so that, said air release valve and said igniter fuel release valve are open during at least a portion of each said potential combustion time interval and said primary ignition means is energized in order to initiate said burning time interval, and so that said air release valve and said igniter fuel release valve are closed at time intervals other than said burning time interval;

a fixed open connection between said variable volume chamber and said enclosed air driver volume of said air displacer means and also said enclosed igniter fuel driver volume of said igniter fuel displacer means;

a source of air at an air supply pressure;

an air supply valve and air supply valve drive means and an air supply valve inlet and an air supply valve outlet;

said air supply valve inlet being connected to said source of air and said air supply valve outlet being connected to said enclosed air displacer volume of said air displacer means;

air supply interdrive means for driving said air supply valve drive means from said drive means for driving said internal combustion engine mechanism so that said air supply valve is open only during said exhaust and intake time interval;

a source of igniter fuel at an igniter fuel supply pressure;

an igniter fuel supply valve and igniter fuel supply valve drive means and an igniter fuel supply valve inlet and an igniter fuel supply valve outlet;

said igniter fuel supply valve inlet being connected to said source of igniter fuel and said igniter fuel supply valve outlet being connected to said enclosed igniter fuel displacer volume of said igniter fuel displacer means;

igniter fuel supply interdrive means for driving said igniter fuel supply valve drive means from said drive means for driving said internal combustion engine mechanism so that said igniter fuel supply valve is open only during said exhaust and intake time interval;

air displacer retraction means for retracting said air displacer piston during said exhaust and intake time interval, when said air supply valve is open, so that said air displacer volume of said air displacer means is increased;

igniter fuel displacer retraction means for retracting said igniter fuel displacer piston during said exhaust and intake time interval, when said igniter fuel supply valve is open, so that said igniter fuel displacer volume of said igniter fuel displacer means is increased.

5,813,380

SUCTION CONTROL DEVICE FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE

Akira Takahashi; Toru Hashimoto; Mitsuhiro Miyake; Shigekazu Yamauchi, all of Tokyo; Hideo Kakinuma, Odawara; Kiyoshi Shinjyo, Odawara; Shigeyuki Ishiguro, Odawara; Naruo Tsukakoshi, Yokohama; Hisakazu Miya, Yokohama, and Naoto Nishimoto, Yokohama, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; Mikuni Corporation, both of Tokyo, and Tokyo Roki Corporation, Kanagawa, all of Japan

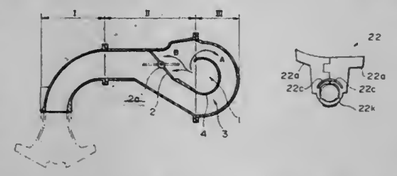
PCT No. PCT/JP94/02083, § 371 Date Oct. 16, 1995, § 102(e) Date Oct. 16, 1995, PCT Pub. No. WO95/16112, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 12, 1994, Ser. No. 501,008

Claims priority, application Japan, Dec. 10, 1993, 5-310916; Dec. 10, 1993, 5-310917; Dec. 10, 1993, 5-310918; Dec. 10, 1993, 5-310919

Int. Cl.[6] F01L *1/00;* **F16C** *27/00*

U.S. Cl. 123—184.55 **5 Claims**



1. A suction control device for a multiple cylinder internal combustion engine comprising:

a shell body being made from a resin material, and having suction paths each communicated to each cylinder in a multi-cylinder internal combustion engine;

a rotary shaft penetrating and born by said shell body;

butterfly valves each supported by said rotary shaft and provided in each of said suction paths so that said butterfly valves can freely open or close said suction paths respectively; and

a bearing fixed onto said shell body and supporting said rotary shaft so that said rotary shaft can freely rotate,

said butterfly valves and said rotary shaft being made from a monolithically molded resin material,

said rotary shaft having a curved surface section in a border area between each pair of neighboring ones of said butterfly valves,

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each of said butterfly valves including a padding section having a streamlined form in the intake air flowing direction in a border area between said rotary shaft and each of said butterfly valves, and

said bearing comprising:

a pair of engaging pieces being engageable with each other so as to radially bear said rotary shaft therebetween when they are engaged with each other, and

a resilient contacting piece monolithically formed in a portion facing said rotary shaft of each of said engaging piece for radially urging said rotary shaft.

5,813,381

HARNESS HOLDER FIXING STRUCTURE IN ENGINE

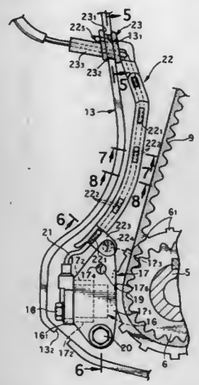
Kazuhito Kakimoto; Shigeru Maruyama, and Yoshiaki Koyama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1997, Ser. No. 827,720

Claims priority, application Japan, Apr. 12, 1996, 8-091510

Int. Cl.[6] F02D *45/00;* **F02B** *77/00*

U.S. Cl. 123—195 A **20 Claims**



1. A harness holder fixing structure in an engine including a harness disposed to extend inside and outside a cover member which covers a driving-force transmitting means for transmitting a driving force of a crankshaft, wherein a harness holder for supporting said harness is disposed within the cover member, and said harness holder is provided with a locking portion operatively engaged with said cover member.

5,813,382

OIL PAN DRAIN PORT ADAPTER SYSTEM FOR ENGINE FLUSHING APPARATUS

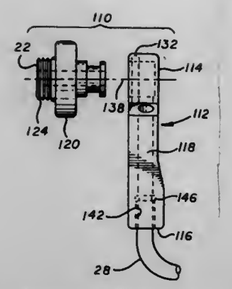
Victor A. Grigorian, Glendale; Martin Renwick, Sherman Oaks, and Seymour Seplow, Studio City, all of Calif., assignors to EnviroLution, Inc., Glendale, Calif.

Filed May 13, 1997, Ser. No. 854,993

Int. Cl.[6] F01M *1/00*

U.S. Cl. 123—196 R **22 Claims**

1. An oil pap drain port adapter assembly for an engine flushing system for circulating flushing fluid through an internal combustion engine to clean the engine, the engine being of the type containing an engine block, the engine block having an oil filter port and an oil drain pan having an oil drain pan port, the oil filter port and the oil drain pan port being in fluid communication, the flushing system including flushing apparatus for delivering a volume of flushing fluid to the oil filter port and for receiving used flushing fluid from the oil drain pan port, a first conduit for



delivering flushing fluid from the flushing apparatus to the oil filter port, and a second conduit for conducting flushing fluid from the oil drain pan port to said flushing apparatus, the drain pan port adapter assembly fitting the oil drain pan port of the engine and creating a liquid tight seal therewith, the drain pan port adapter assembly comprising:

a main adapter member having a longitudinal axis, an inlet end, an outlet end, and an interior flow passage connecting the inlet end and outlet end in fluid communication; and

an interchangeable adapter member having a first threaded cylindrical end portion for engaging and mating with a corresponding threaded portion in the oil pan drain port, an opposing end portion forming an annulus, and an interior lumen connecting the first threaded cylindrical end portion and the opposing end portion in fluid communication, the annulus having a surface defining a plurality of apertures extending through the annulus to the interior lumen of the interchangeable adapter member to permit fluid flow from the interchangeable adapter member to the inlet of the main adapter member, the opposing end portion of the interchangeable adapter member being received in the inlet end of the main adapter member at a fixed angle of orientation with respect to the longitudinal axis of the main adapter member.

5,813,383

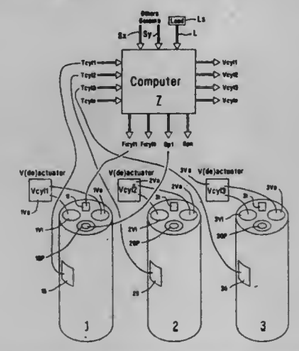
VARIABLE DISPLACEMENT DIESEL ENGINE

Henry W. Cummings, 3313 W. Adams St., St. Charles, Mo. 63301

Filed Sep. 4, 1996, Ser. No. 706,998

Int. Cl.[6] F02B *77/00*

U.S. Cl. 123—198 F **29 Claims**



1. In a method of operating a variable displacement Diesel engine including:

providing a Diesel engine having a plurality of cylinders with pistons movable within said cylinders; said pistons connected to a crank shaft; said cylinders at least partially defining

combustion chambers in said engine; supplying Diesel fuel to said combustion chambers;

activating glow plugs for heating said combustion chambers to minimum operating temperature; operating valve means for introducing air and fuel for combustion into said combustion chambers, and for allowing combustion gasses to exist from said combustion chamber; applying a load to said crank shaft;

the improvement comprising: under computer control reducing the number of operative cylinders under reduced load operating conditions including discontinuing the supply of fuel to selected cylinders; and under increased load conditions, computer controlled activating additional cylinders, including providing said deactivated cylinders with fuel for combustion; and computer controlled activating the respective glow plugs of the previously inactive cylinders if the temperature of said inactive cylinders has become below a minimum operating temperature, to heat up the deactivated cylinders and then re-introducing fuel into said deactivated cylinders.

5,813,384

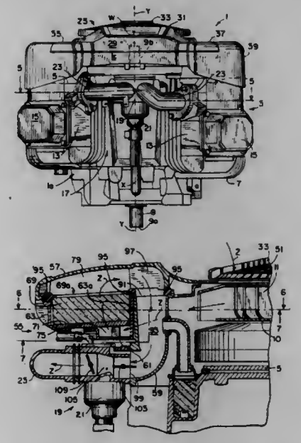
INTAKE SYSTEM ARRANGEMENT FOR V-TYPE ENGINE

Stephen J. Lavender, Racine, and Gregg R. Herde, Germantown, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Aug. 20, 1997, Ser. No. 915,354

Int. Cl.[6] F02B *75/22*

U.S. Cl. 123—198 E **32 Claims**



1. An air intake system for an internal combustion engine, the engine having a crankcase, a vertically extending crankshaft, and at least one pair of substantially horizontally disposed cylinders that extend outwardly from the crankcase to form a V-space therebetween, said intake system comprising:

an air intake inlet;

an air cleaner including a filter and adapted to receive air from said air intake inlet such that said air flows through said filter in a substantially upward direction, said air cleaner being disposed substantially directly above the V-space; and

an intake manifold positioned downstream of said filter and disposed in fluid flow communication with each of the cylinders.

5,813,385

COMBUSTION CHAMBER STRUCTURE HAVING PISTON CAVITY

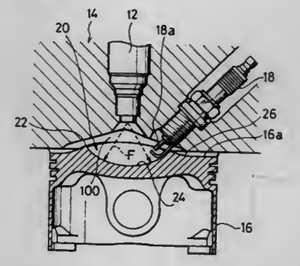
Toyosei Yamauchi, Tachikawa, and Koji Morikawa, Higashikurume, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1997, Ser. No. 929,280

Claims priority, application Japan, Oct. 8, 1996, 8-267526

Int. Cl.[6] F02F *3/26*

U.S. Cl. 123—276 **9 Claims**



1. An internal combustion engine having a cylinder, a piston movably disposed in said cylinder for reciprocal motion, a cylinder head, an intake valve disposed in said cylinder head for introducing an air and an exhaust valve disposed in said cylinder head for exiting burned gases, comprising:

a pentroof-shaped combustion chamber provided on a lower surface of said cylinder head;

a fuel injector disposed at the top and in the center of said pentroof-shaped combustion chamber so as to inject a fuel in the downward direction and form a fuel spray;

a spark plug disposed in said cylinder head with its electrode situated in proximity of said intake valve; and

a piston cavity provided on the top surface of said piston and including a circular protruded portion around said piston cavity and a concave portion inside of said circular protruded portion.

5,813,386

CONTROL DEVICE AND CONTROL METHOD FOR LEAN-BURN ENGINE

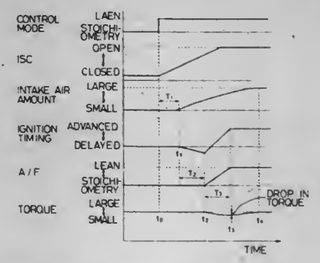
Kojiro Okada; Kazuhide Togai, and Masaji Ishida, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 501,050, Sep. 28, 1995. This application Mar. 28, 1997, Ser. No. 825,335

Claims priority, application Japan, Dec. 28, 1993, 5-338537; Dec. 28, 1993, 5-338538; Mar. 24, 1994, 6-053386

Int. Cl.[6] F02D *43/04*

U.S. Cl. 123—339.14 **18 Claims**



1. A control device for a lean-burn engine, comprising:

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load state detecting means for detecting a load state of the engine;

intake air amount adjusting means for adjusting an amount of intake air supplied to the engine; and

control means for controlling said intake air amount adjusting means according to the engine load state detected by said load state detecting means, so as to cause that change in the load state which permits a difference between output torques of the engine before and after switching to be reduced or canceled, when the switching is made from driving with a first air-fuel ratio which is set equal to a theoretical air-fuel ratio or on a fuel-rich side with respect thereto to driving with a second air-fuel ratio which is set on a fuel-lean side with respect to the theoretical air-fuel ratio, wherein

said intake air amount adjusting means includes an intake flow rate control valve provided in an intake passage for introducing the intake air into a combustion chamber of the engine, and

said control means controls the intake air amount of the engine towards an increasing side and temporarily delays ignition timing of the engine so as to be adapted for increase of the intake air amount, and then controls the ignition timing towards an advance side and controls air-fuel ratio towards a lean side.

5,813,387

CHANGE GEAR CONTROL DEVICE USING ACCELERATION AND GEAR RATIO AS PARAMETERS FOR AUTOMATIC TRANSMISSION IN A MOTOR VEHICLE AND THE METHOD THEREFOR

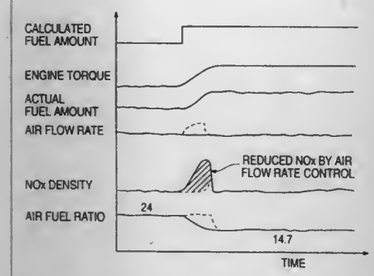
Toshimichi Minowa, Toukai-mura; Hiroshi Kimura, Hitachi; Yoshiyuki Yoshida, Yokohama; Yoshishige Ohyama, and Yutaka Nishimura, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 189,782, Feb. 1, 1994, Pat. No. 5,643,133, which is a continuation-in-part of Ser. No. 107,018, Aug. 17, 1993, Pat. No. 5,470,290, which is a continuation-in-part of Ser. No. 840,816, Feb. 25, 1992, Pat. No. 5,235,876. This application Dec. 27, 1996, Ser. No. 773,416

Claims priority, application Japan, Feb. 25, 1991, 3-50148

Int. Cl.[6] F02D *41/00*

U.S. Cl. 123—436 **3 Claims**



1. A method of controlling an internal combustion engine of a motor vehicle which is operated with air fuel mixture gas having air fuel ratio ranging from a fuel rich air fuel ratio to a fuel lean air fuel ratio depending on driving conditions of the motor vehicle and which is equipped with an automatic transmission of which transmission speed ratio change is determined based on a vehicle speed and an engine torque comprising the steps of:

detecting an instant when air fuel ratio is changed; and

changing air flow rate for the detected instant to reduce NOx density exhausted from the engine.

5,813,388

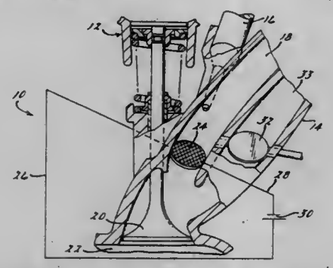
HEATED ASSEMBLY FOR VAPORIZATION OF FUEL IN AN INTERNAL COMBUSTION ENGINE

Harry Arthur Cikanek, Jr., Northville, and George Carver Davis, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 16, 1997, Ser. No. 784,217

Int. Cl.[6] F02M *1/08;31/00*

U.S. Cl. 123—549 **4 Claims**



1. A heated assembly for vaporization of fuel in an internal combustion engine comprising:

a grid disposed in an inlet runner of the internal combustion engine;

means for heating said grid during cold start of the internal combustion engine and vaporizing fuel in the inlet runner of the internal combustion engine;

a rotatable shaft, said grid being mounted to said shaft; and

a secondary inlet runner having a throttle plate contained therein, said throttle plate being mounted to said shaft such that said grid and said throttle plate will open simultaneously.

5,813,389

CYLINDER-BY-CYLINDER AIR-FUEL RATIO-ESTIMATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

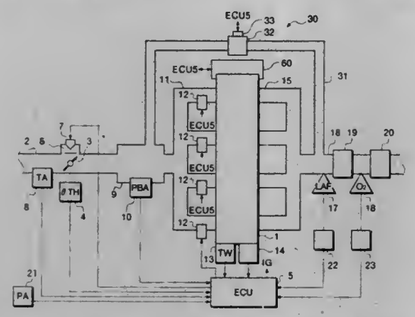
Toru Kitamura, and Akira Kato, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Minato-ku, Japan

Filed Aug. 6, 1997, Ser. No. 906,964

Claims priority, application Japan, Aug. 8, 1996, 8-224611

Int. Cl.[6] F02D *41/14*

U.S. Cl. 123—673 **4 Claims**



1. In a cylinder-by-cylinder air-fuel ratio-estimating system for an internal combustion engine having a plurality of cylinders, and an exhaust system including at least one confluent portion, the cylinder-by-cylinder air-fuel ratio-estimating system including air-fuel ratio-detecting means arranged in said exhaust system at said confluent portion, and cylinder-by-cylinder air-fuel ratio-estimating means for estimating an air-fuel ratio of a mixture supplied to each of said cylinders, based on an output from said air-fuel ratio-detecting means, by using an observer for observing an internal operative state of said exhaust system based on a model representative of a behavior of said exhaust system,

the improvement wherein:

said cylinder-by-cylinder air-fuel ratio-estimating means changes a gain for use in the estimation of said air-fuel ratio of said mixture supplied to said each of said cylinders by said observer, according to operating conditions of said engine.

5,813,390

ENGINE FEEDBACK CONTROL EMBODYING LEARNING

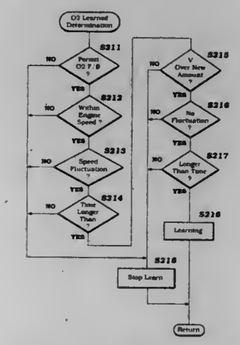
Takayuki Anamoto, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-ken, Japan

Continuation-in-part of Ser. No. 630,604, Apr. 10, 1996. This application Sep. 17, 1996, Ser. No. 714,945

Claims priority, application Japan, Apr. 11, 1995, 7-85194

Int. Cl.[6] F02D *41/14*

U.S. Cl. 123—674 **23 Claims**



1. An internal combustion engine comprising a combustion chamber, an air-fuel charging system for delivering an air and fuel charge to said combustion chamber for combustion therein, a combustion condition sensor for determining the air/fuel ratio in said combustion chamber, control means for adjusting the air/fuel ratio delivered to said combustion chamber, said control means including a feedback mode for adjusting the air/fuel ratio delivered to said combustion chamber in response to the output of said combustion condition sensor, said feedback mode operational when said engine is operating in a first operational range, said control means further including a learning mode and a memory for storing corrective data from said sensor during operation of said learning mode, said learning mode operational in a second engine operational range narrower than but within said first operational range, said control means utilizing the contents of said memory for subsequent control of said engine air/fuel ratio.

5,813,391

METHOD AND APPARATUS FOR PITCHING AND LOBBING BALLS

Albert Johnson, 3201 Sam Bass Rd., Round Rock, Tex. 78681

Filed Feb. 17, 1995, Ser. No. 390,063

Int. Cl.[6] A63B *65/12*

U.S. Cl. 124—6 **26 Claims**

1. An apparatus for throwing balls, comprising:

a rotor member including:

a mounting member for coupling with a shaft of a motor and which is positioned substantially orthogonal to said shaft of said motor; first and second parallel rails coupled to said mounting member and spaced apart a preselected distance which is sufficient to accommodate said balls for defining a ball path by restricting movement of said balls;

said motor having a motor shaft coupled to said rotor member for turning said rotor member;

a stator member having an inlet for receiving said balls and allowing passage to a region between said first and second parallel rails, and an outlet for discharging said balls from said region between said first and second parallel rails;

wherein said stator member completely encloses said rotor member and motor shaft thus enclosing all moving parts.

19. A method of throwing a ball, comprising:

providing an elongated rotor member with a central inlet and first and second outlets at each end, and engaged by a motor shaft;

providing a housing which encloses said elongated rotor and said motor shaft;

rotating said elongated rotor at a high rate of rotation; introducing a ball into said elongated rotor at said central inlet;

allowing gravity to move said ball to a particular one of said first and second outlets of said elongated rotor;

utilizing centrifugal force from rotation of said elongated rotor to accelerate said ball; and

discharging said ball from said elongated rotor at a high velocity.

5,813,392

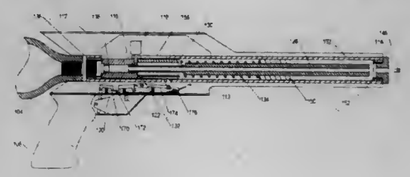
COMPRESSED GAS GUN

John A. McCaslin, 4104 Steeplewood Ct., Arlington, Tex. 76016

Filed Jan. 3, 1998, Ser. No. 2,573

Int. Cl.[6] F41B *11/00*

U.S. Cl. 124—73 **9 Claims**



1. An air gun, comprising:

a frame having a breech opening formed therein;

a barrel having a breech, said barrel attached to said frame such that said breech is accessible through said breech opening;

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a hammer mounted within said frame, and having a cocking pawl formed therein;

a spring disposed between said frame and said hammer;

a valve attached to said frame and having a gas port for expelling compressed gas upon actuation of said valve;

a breech seal having a valve opening and a barrel opening formed therein, said breech seal further having a gas conduit formed therein coupling said valve opening to said barrel opening, said breech seal slidably disposed about said barrel between a loading position and a discharge position, and wherein said breech seal exposes a substantial portion of said breech opening when said breech seal is located in said loading position thereby allowing access to said breech though said breech opening for manual loading of a projectile into the breech of said barrel, and wherein said breech seal closes a substantial portion of said breech opening when said breech seal is located in said discharge position;

a trigger assembly attached to said frame and operable to engage said cocking pawl and retain said hammer at a position away from said breech seal, and wherein actuation of said trigger assembly releases said cocking pawl thereby allowing said spring to urge said hammer against said breech seal so as to activate said valve thereby expelling compressed gas through said gas conduit, into said breech, and propelling the projectile.

5,813,393

OVEN AND METHOD FOR GENERATING HEAT FOR AN OVEN

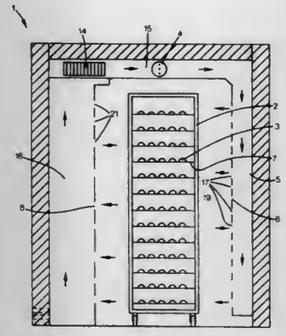
Jonas Persson, Fristad, and Lennart Larsson, Sandhult, both of Sweden, assignors to Sveba-Dahlen AB, Fristad, Sweden

Filed Apr. 14, 1997, Ser. No. 839,450

Claims priority, application Sweden, Apr. 22, 1996, 9601610

Int. Cl.[6] F24C *15/32*

U.S. Cl. 126—21 A **6 Claims**



1. An oven, comprises:

a top channel defined at a top portion of the oven;

a fan disposed in the top channel;

a heat generating device, disposed in the top channel downstream of the fan, for generating heat for processing a food product disposed in a chamber defined in the oven, the heat generated being transferred to the food product by convection, the heat generating device comprising a catalytic burner device adapted to effect all of the heat generation;

a first vertical passageway defined along a first side of the oven, the first vertical passageway being in fluid communication with the top channel;

an innerwall dividing the chamber from the first vertical passageway, the inner wall having a plurality of openings defined therein so that the heat from the heat generating device is discharged by convection into the chamber; and

a second vertical Passageway defined along a second side of the oven that is the first side, the second vertical passageway being in fluid communication with the chamber and the top channel.

5,813,394

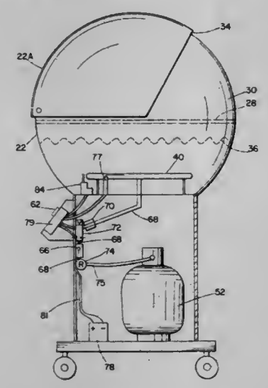
COOKING GRILL WITH MOISTURE-INSENSITIVE FLAME DETECTOR

Todd W. Clifford, Cincinnati, Ohio, assignor to Convenience Technologies, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 283,992, Aug. 1, 1994, Pat. No. 5,617,840, and a continuation-in-part of Ser. No. 856,347, Mar. 23, 1992, Pat. No. 5,333,596. This application Jan. 25, 1996, Ser. No. 591,398

Int. Cl.[6] A47J *37/00;* **F24C** *3/00*

U.S. Cl. 126—41 R **20 Claims**



1. A cooking grill which comprises:

a food-positioning rack;

a burner disposed below the rack for distributing a flame;

a conduit for conveying a cooking fuel to the burner;

a source of cooking fuel connected to the conduit;

a control circuit;

an electrically actuated fuel shut-off valve interposed on the conduit between the source of fuel and the burner and electrically connected to the control circuit;

connective means for electrically connecting the control circuit to a source of electricity; and

a flame detector electrically connected to the control circuit, the flame detector having a flame sensor and a hot surface igniter, the flame detector adapted to determine the presence or absence of flame in the presence of moisture disposed adjacent to the burner;

wherein the control circuit, in response to a false signal from the flame sensor, switches on the hot surface igniter and opens the shut-off valve, then switches the hot surface igniter off after a predetermined period of time and closes the shut-off valve, so as to remove moisture from the flame sensor.

5,813,395

DEVICE FOR PROTECTING RIMS IN GLASS OR CERAMIC BODIES

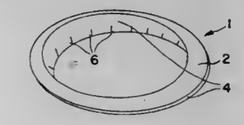
Martin Taplan, Rheinbollen; Stefan Hubert, Bubenheim; Boris Marx, Oberwiesen, and Thomas Heisner, Mainz, all of Germany, assignors to Schott Glaswerke, Mainz, Germany

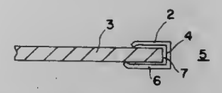
Filed Nov. 29, 1995, Ser. No. 564,473

Claims priority, application Germany, Nov. 30, 1994, 44 42 572.4

Int. Cl.[6] F24C *13/10*

U.S. Cl. 126—214 A **21 Claims**





1. A clasp for protecting a rim of an opening in a substrate made of glass, ceramic or glass ceramic, said clasp comprising:

a circular body, a collar attached to the top of said circular body and extending outward from the axis of said circular body, and, attached to the bottom of said circular body, at least three tabs bendable in a direction away from said axis of said circular body.

5,813,396

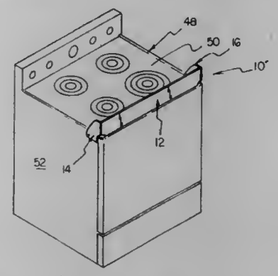
RANGE GUARD APPARATUS AND METHOD

Raymond W. Bessette, 3360 NW. 22nd Pl., Coconut Creek, Fla. 33066

Continuation-in-part of Ser. No. 22,370, May 4, 1994, which is a continuation of Ser. No. 948,993, Sep. 21, 1992, abandoned. This application Oct. 31, 1996, Ser. No. 742,100

Int. Cl.[6] F24C *15/10*

U.S. Cl. 126—214 D **13 Claims**



1. Apparatus for preventing splattering in the vicinity of a cooking appliance having a top surface with heating elements, said top surface being defined by at least a front edge and first and second side walls extending rearwardly with respect to said front edge, said apparatus comprising:

a front transverse wall member having opposed first and second ends,

at least one side wall member connected to said front transverse member proximal to a first or second end thereof,

said at least one side wall member having a portion for engaging a confronting side wall portion of said appliance when said transverse member is placed on said top surface proximal to said front edge thereof whereby splattering of food caused by cooking thereof on one or more of said heating elements is substantially deflected away from said front edge of said appliance by said transverse wall member and said at least one side wall member toward said heating elements,

wherein said front transverse wall member includes a bottom edge extending longitudinally between said first and second ends thereof and said portion for engaging said confronting side wall portion of said appliance extends below said bottom edge, and

wherein said at least one side wall member portion for engaging said confronting side wall portion of said appliance below said bottom edge of said transverse wall member terminates in a first edge distal with respect to said front transverse wall member and terminates in a second edge proximal to said front transverse wall member, said first distal edge being orthogonally oriented with respect to said second proximal edge, said second proximal edge being parallel to said first or second ends of said front transverse wall member.

5,813,397

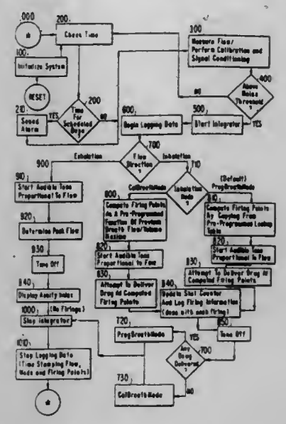
DELIVERY OF AEROSOL MEDICATION FOR INSPIRATION

David E. Goodman, Brookline, and Reid M. Rubsamen, Boston, both of Mass., assignors to Aradigm Corporation, Hayward, Calif.

Continuation of Ser. No. 636,958, Apr. 24, 1996, Pat. No. 5,655,516, which is a continuation of Ser. No. 457,148, Jun. 1, 1995, which is a division of Ser. No. 353,162, Dec. 9, 1994, Pat. No. 5,542,410, which is a continuation of Ser. No. 664,758, Mar. 5, 1991, Pat. No. 5,404,871. This application Apr. 25, 1997, Ser. No. 845,802

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.14 **3 Claims**



1. A method for delivering an aerosol of insulin to a subject for inspiration, said method characterized by:

monitoring inspiratory flow;

calculating a firing threshold parameter based on the monitored inspiratory flow;

determining whether each detected inspiratory flow is one of a first flow detected following a reset flow event or a subsequent flow detected following a detected flow that is not followed by a reset flow event, the reset flow event being any of a release of an amount of insulin and initialization of operation of the apparatus;

selecting a delivery threshold corresponding to a point in the detected inspiratory flow at which an amount of an aerosol of insulin is to be released characterized by selecting a prese-

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lected delivery threshold in response to the detected inspiratory flow being a determined first flow and selecting a calculated delivery threshold that is calculated based on a sensed flow parameter of the preceding detected inspiratory flow in response to the detected inspiratory flow being a determined subsequent flow; and

determining whether or not the detected inspiratory flow satisfies the selected delivery threshold, and

(i) in response to the detected inspiratory flow satisfying the selected delivery threshold, releasing an amount of the narcotic to generate an aerosol of insulin; and

(ii) in response to determining that the detected inspiratory flow did not satisfy the selected delivery threshold, calculating a new delivery threshold based on the detected inspiratory flow so that the selected delivery threshold for the next detected inspiratory flow determined to be a subsequent flow is the last calculated delivery threshold.

5,813,398

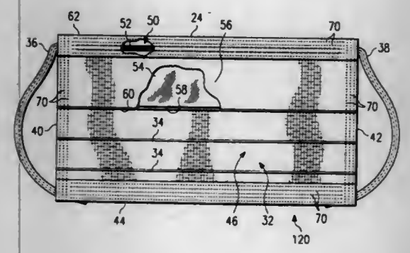
COMBINED ANTI FOG AND ANTI GLARE FEATURES FOR FACE MASKS

Derek W. Baird, Colleyville, and Kevin K. Brunson, Argyle, both of Tex., assignors to Tecnol Medical Products, Inc., Fort Worth, Tex.

Filed Mar. 26, 1997, Ser. No. 828,252

Int. Cl.[6] A62B *18/08;7/00;23/02*

U.S. Cl. 128—201.17 **11 Claims**



1. A face mask having a filter body for covering the nose and mouth of a wearer, the filter body having an exterior surface with a top edge, bottom edge, and opposite side edges extending therebetween, and means for securing the face mask to the wearer's face, comprising:

a layer of fluid impervious film disposed over the exterior surface of the filter body adjacent to the top edge for restricting the flow of moisture therethrough;

a layer of non-woven material in juxtaposition with and covering the layer of fluid impervious film;

the layer of fluid impervious film and the layer of non-woven material having a generally rectangular configuration corresponding with adjacent portions of the filter body;

the layer of fluid impervious film and the layer of non-woven material each having a top edge bonded with the top edge of the filter body;

the layer of fluid impervious film and the layer of non-woven material each having opposites side edges extending from the respective top edge with the side edges of the layer of fluid impervious; film and the side edges of the layer of the non-woven material bonded with adjacent portions of the side edges of the filter body;

the length of the side edges of the layer of fluid impervious film and layer of non-woven material is less than the length of the respective side edges of the filter body; and

the layer of fluid impervious film and the layer of non-woven material, each having a bottom edge opposite from the respective top edge adjacent the exterior surface of the filter body and above the bottom edge of the filter body with no bonding between the respective bottom edges and the filter body to allow the passage of air between the bottom edge of the layer of fluid impervious film and adjacent portions of the filter body.

5,813,399

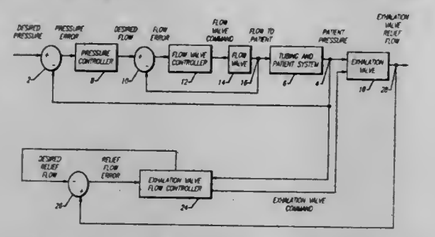
SYSTEM AND METHOD FOR CLOSED LOOP AIRWAY PRESSURE CONTROL DURING THE INSPIRATORY CYCLE OF A BREATH IN A PATIENT VENTILATOR USING THE EXHALATION VALVE AS A MICROCOMPUTER-CONTROLLED RELIEF VALVE

Fernando J. Isaza, San Marcos, and Stanley Y. Wong, Oceanside, both of Calif., assignors to Puritan Bennett Corporation, Carlsbad, Calif.

Continuation of Ser. No. 366,293, Dec. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 33,259, Mar. 16, 1993, abandoned. This application Jan. 10, 1997, Ser. No. 782,563

Int. Cl.[6] A61M *16/00;* **A62B** *7/00;9/02;* **F16K** *31/02*

U.S. Cl. 128—204.21 **15 Claims**



1. A method of controlling airway pressure in a ventilator for a patient during the inspiratory cycle of a breath, the breathing gas circuit having a source of breathing gas, an airway flow path supplying the breathing gas to a breathing attachment for the patient, a flow supply valve for controlling the supply of breathing gas to the breathing attachment for the patient, a relief valve for controlling venting of breathing gas from the patient to the atmosphere, the airway flow path being in fluid communication with the breathing attachment for the patient, the steps of the method comprising:

delivering a supply flow of breathing gas to the patient breathing attachment through the flow supply valve at a predetermined rate of supply flow based upon a desired airway pressure and actual airway pressure;

determining a desired rate of outflow through the relief valve;

generating a relief valve command signal based upon the airway pressure and the desired rate of outflow to control operation of the relief valve to vent the breathing gas from the relief valve; and

venting the breathing gas from the patient breathing attachment through the relief valve during the inspiratory cycle at a rate based upon the airway pressure and the desired rate of outflow.

5,813,400

BREATHING APPARATUS

Pierre Bühlmann, Lidingö, and Ivan Hellquist, Sollentuna, both of Sweden, assignors to Comasec International S.A., Saint Denis, France

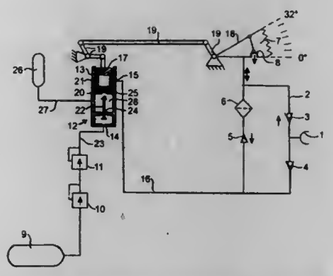
Filed Jul. 3, 1996, Ser. No. 674,794

Claims priority, application Sweden, Jul. 5, 1995, 9502441

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—204.23 **11 Claims**

1. Breathing apparatus for use under water, or in a non-respiratory atmosphere, comprising a breathing mask or a mouth-



piece a respiratory circuit with a volumetrically variable gas accumulator connected to the mask or the mouth-piece, and a metering bottle connected to the circuit via a valve device, which alternatingly connects the bottle to a source of fresh respiratory gas for filling the bottle and to the circuit for emptying the bottle, wherein the valve device is adapted to fill and empty the metering bottle during each respiratory cycle of a user and to adjust an amount of fresh respiratory gas supplied to the metering bottle in response to a respiratory volume of inhalation or exhalation of the preceding respiratory cycle, such that fresh respiratory gas is supplied to the respiratory circuit during each such cycle.

5,813,401

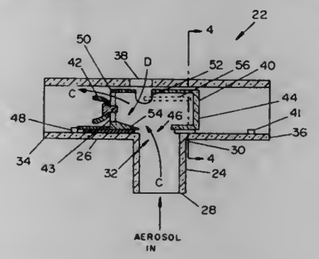
NEBULIZER AUTOMATIC CONTROL VALVE

Janet H. Radcliff, 160 Foxshire Dr., Lancaster, Pa. 17601; Gordon R. Hostetter, 1634 Campus Rd., Elizabethtown, Pa. 17022; Meyric K. Rogers, 1037 Woods Ave., Lancaster, Pa. 17603, and Gregg M. Bair, 40 Holly Dr., Leola, Pa. 17540

Filed Oct. 15, 1996, Ser. No. 732,774

Int. Cl.[6] A61H *16/00*

U.S. Cl. 128—205.24 **25 Claims**



1. A control valve for a nebulizer comprising:

a straight hollow tube having an open patient's end, an opening to surrounding atmosphere located remote from the patient's end, a feed hole in the tube wall through which medicated aerosol can be supplied, and an exhalation hole in the tube wall; and

a straight hollow shuttle, with the shuttle positioned within the tube so that the shuttle is adjacent to the tube wall and slides back and forth within the tube in a region between the patient's end and the opening, the shuttle including:

a closed end remote from the patient's end of the tube,

an inlet hole in the shuttle wall, with the shuttle constructed and the inlet hole located so that when the shuttle is in a first position, the inlet hole and the feed hole are aligned, and the exhalation hole is closed off by the shuttle, and when the shuttle is in a second position which is more remote from the patient's end of the tube than the first position, the tube closes off the inlet hole, the shuttle closes off the feed hole, and the exhalation hole is open, and

a check valve located within the shuttle in a position between the inlet hole and the patient's end and operating to permit flow only from within the shuttle out to the patient's end of the tube;

wherein the shuttle is located close enough to the tube wall and the sliding friction between the shuttle and the tube wall is maintained low enough so that the pressure of a user's exhalation and the vacuum of a user's inhalation is sufficient to move the shuttle back and forth within the tube.

5,813,402

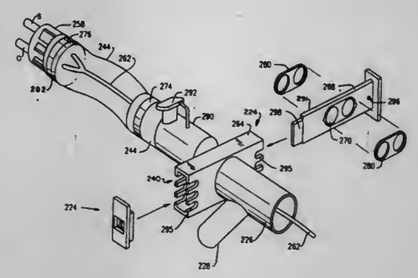
VALVE FOR PULMONARY CATHETER

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903

Filed Apr. 9, 1997, Ser. No. 831,654

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—207.16 **11 Claims**



1. A pulmonary valve apparatus for providing medication to a patient including

a generally tubular body providing a flow path from a source of medication to a patient,

said tubular body having a first end adapted to be coupled to various forms of medication and a second end adapted to be coupled to a patient for receiving said medication,

a slide means disposed within a slide path in said tubular body for selectively closing and opening said flow path through said tubular body, and

sealing means disposed between said slide means and said slide path for insuring a tight seal between said slide means and said slide path; a valve coupled to said rear portion of said tubular body, a source of suction and a source of oxygen coupled to said valve, said valve being operable to connect either suction or oxygen to said tubular body and thus to a patient.

5,813,403

OPTICAL MEASUREMENT OF TISSUE PH

Babs R. Soller, 15 Franklin Cir., Northboro, Mass. 01532, and Ronald H. Micheels, 176 Jennie Dugan Rd., Concord, Mass. 01742

Filed Nov. 8, 1995, Ser. No. 555,102

Int. Cl.[6] A61B *5/000*

U.S. Cl. 128—633 **54 Claims**

1. A non-invasive method for determining the localized pH of a sample tissue disposed underneath a covering tissue of a patient, said method comprising:

irradiating the sample tissue with optical radiation not substantially absorbed by the covering tissue such that the radiation propagates through the covering tissue to irradiate the sample tissue;

collecting radiation from the sample tissue which passes through the covering tissue to determine an optical spectrum; and,

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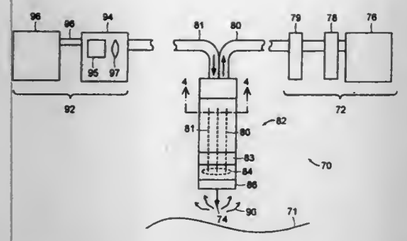


processing the optical spectrum and a mathematical model to determine the localized pH of the sample tissue, said model relating optical spectra to known pH values of interstitial fluid in tissue.

12. A method of claim 1, wherein the localized pH is in a pH range of about 5.8 to 7.6.

5,813,404

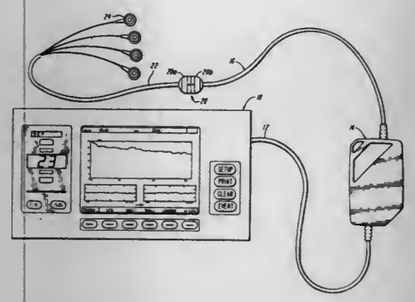
ELECTRODE CONNECTOR SYSTEM

Philip H. Devlin, Brookline; Nassib G. Chamoun, West Roxbury; John R. Shambroom, Arlington; Mark E. Bruckner, Reading, and Todd A. Marcus, Groton, all of Mass., assignors to Aspect Medical Systems, Inc., Natick, Mass.

Filed Oct. 20, 1995, Ser. No. 545,981

Int. Cl.[6] A61B *5/04*

U.S. Cl. 128—639 **14 Claims**



1. An electrode connector system which is used to connect one or more electrodes to a physiological signal monitor, said connector system comprising:

an electrode connector connected through a patient interface cable to said one or more electrodes:

a monitor connector connected to a pigtail cable;

each of said electrode connector and said monitor connector having a plurality of signal lines dedicated to transmit a corresponding one or more channels of a predetermined type of physiological signals and at least two electrode connector identification lines dedicated to transmit a unique identification code associated with a unique electrode configuration.

5,813,405

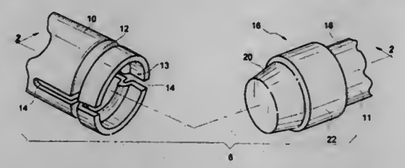
SNAP-IN CONNECTION ASSEMBLY FOR EXTENSION GUIDEWIRE SYSTEM

Fausto Montano, Jr., Palm Springs North, and Fernando M. Viera, Hialeah, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 579,920, Dec. 28, 1995, abandoned, which is a continuation of Ser. No. 88,618, Jul. 6, 1993, abandoned, which is a continuation of Ser. No. 734,718, Jul. 23, 1991, abandoned. This application Mar. 3, 1997, Ser. No. 807,997

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—772 **20 Claims**



1. An extension guidewire system comprising an initially inserted guidewire having a proximal end and a proximal end portion, an extension guidewire adapted to be connected axially to said proximal end portion of said initially inserted guidewire, and a connector assembly not including a retractable spring biased sleeve;

said extension guidewire having a distal end, a distal end portion and a proximal end; and

said connector assembly consisting essentially of:

a snap-in sleeve or tube which is made from a medically suitable metal tubing and which is mounted at one of the distal end of said extension guidewire and the proximal end of said initially inserted guidewire;

an engageable means on one of said proximal end portion of said initially inserted guidewire and said distal end portion of said extension guidewire for axially engaging and elastically deforming said snap-in sleeve when at least one of said engageable means and said snap-in sleeve is moved relative to the other in an axial direction only; and

a radially inwardly extending detent in said snap-in tube which is positioned to engage against and lock with said engageable means on the other of said proximal end portion of the initially inserted guidewire and said distal end portion of said extension guidewire upon relative axial movement of said proximal end portion of the initially inserted guidewire and of said distal end of said extension guidewire and said snap-in tube toward, and into engagement with, each other followed by substantial elastic recovery of said snap-in sleeve when said detent moves into engagement with said engagable means, and said snap-in sleeve and said engageable means being disengagable upon axially pulling them apart.

5,813,406

STRAIN-SENSING GONIOMETERS, SYSTEMS AND RECOGNITION ALGORITHMS

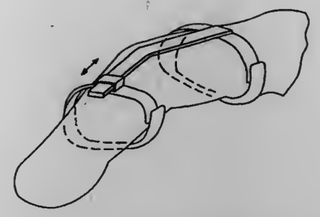
James F. Kramer, Stanford; William R. George, San Francisco, and Peter Lindener, Los Altos, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Division of Ser. No. 148,991, Nov. 8, 1993, Pat. No. 5,442,729, which is a division of Ser. No. 625,305, Dec. 10, 1990, Pat. No. 5,280,265, which is a continuation of Ser. No. 258,204, Oct. 14, 1988, Pat. No. 5,047,952. This application May 3, 1995, Ser. No. 433,626

Int. Cl.[6] A61B *5/103*

U.S. Cl. 128—782 **17 Claims**

1. A sensing assembly comprising:



a goniometer comprising an inert thin electrically non-conductive flexible support backing; and a variable resistance strain sensing element affixed to said backing, said goniometer having a primary bend axis;

means for electrically connecting said element; and

a guiding element at a position proximal to one end connected to a position proximal to one end of said goniometer, said guiding element being flexible about a secondary bend axis non-intersecting with said primary bend axis and with said secondary bend axis at an angle to said primary bend axis, said guiding element being substantially rigid about an axis colinear with said primary bend axis, and said goniometer being substantially rigid about an axis colinear with said secondary bend axis.

5,813,407

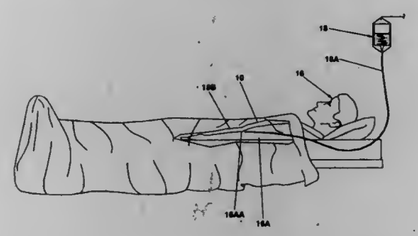
BLANKET WITH PERMEABLE WINDOW

Michael C. Busch, 124 Seaside Cir., Ponte Vedra Beach, Fla. 32082

Filed May 27, 1997, Ser. No. 863,346

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—849 **4 Claims**



1. A blanket with permeable window (10) comprising:

A) a blanket (12) which comprises a blanket top (12T) and a blanket bottom (12B), the blanket (12) further comprises blanket fill (12C) positioned between the blanket top (12T) and the blanket bottom (12B);

B) at least one permeable transparent window (14) is positioned within the blanket (12), a periphery of the at least one permeable transparent window (14) is securely attached to the blanket (12) by at least one fastener (20), a top of the periphery of the permeable transparent window (14) is securely attached to the blanket top (12T) by at least one fastener (20) to the blanket top (12T), a bottom of the periphery of the permeable transparent window (14) is securely attached to the blanket bottom (12B) by at least one fastener (20), the at least one permeable transparent window (14) functions to allow viewing of an intravenous tube (18A) and intravenous needle (18B) of an intravenous (18) which is positioned within a patient appendage vein (16AA) of a patient appendage (16A) of a patient (16).

5,813,408

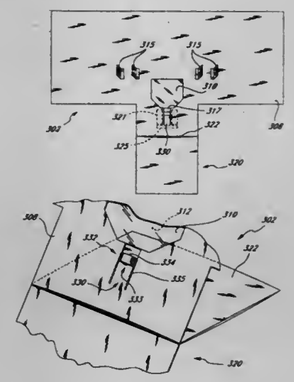
SURGICAL DRAPE

Theodore V. Benderev, San Juan Capistrano; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Boston Scientific Technology, Inc., Maple Grove, Minn.

Division of Ser. No. 345,003, Nov. 23, 1994, which is a continuation of Ser. No. 862,847, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Sep. 15, 1995, Ser. No. 528,848

Int. Cl.[6] A61B *19/10*

U.S. Cl. 128—849 **6 Claims**



1. A surgical drape for transvaginal surgical procedures comprising:

an abdominal portion for positioning over the abdomen of a patient, said abdominal portion having a central region disposed between two lateral sides of said abdominal portion, said central region having an upper portion for placement towards the superior portion of the abdomen and a lower portion for placement towards the inferior portion of the abdomen, said central region having a surgical window therein for locating a surgical site; and

a moisture barrier attached to the lower portion of said central region of said abdominal portion of said surgical drape, said moisture barrier having a support receiving pocket therein for receiving a support structure, said support receiving pocket extending from said moisture barrier so as to be positioned beneath the buttocks of the patient to secure the surgical drape and provide a contamination barrier between the patient's buttocks and the support structure, said moisture barrier also having a speculum receiving site therein.

5,813,409

SURGICAL APPARATUS

Patrick F. Leahy, Blackrock, Ireland; Berwyn M. Crook, Yardley, and Robert D. Rambo, Sellersville, both of Pa., assignors to Medical Creative Technologies, Inc., Colmar, Pa.

Continuation-in-part of Ser. No. 300,346, Sep. 2, 1994, Pat. No. 5,640,977. This application Mar. 29, 1995, Ser. No. 410,316

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—897 **40 Claims**

1. An improved surgical apparatus for hand-assisted minimum invasive surgery with isolation at the site of a wound from ambient conditions, said apparatus including a sleeve of gas-impermeable supple material having an entry opening at a proximal end thereof and an exit opening at a distal end thereof, first sealing means adapted to seal the exit opening around the wound, and second

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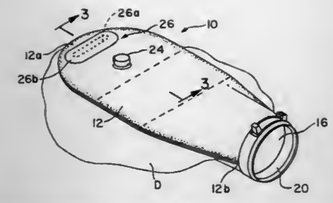
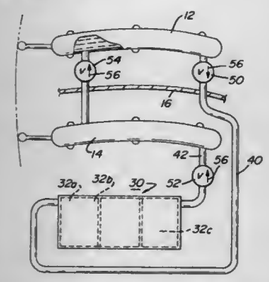


sealing means adapted to seal the entry opening around a surgeon's forearm to create a gastight chamber in said sleeve, the improvement comprising:

at least one port means in said sleeve proximal to said exit opening formed to maintain effective isolation of the wound while passing surgical instruments through said port means into said chamber.

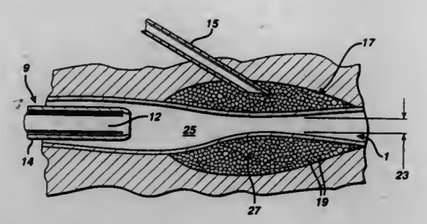
5,813,410
INTERNAL BODY PUMP AND SYSTEMS EMPLOYING SAME
John M. Levin, 412 Fairview Rd., Narbeth, Pa. 19072
Filed Feb. 1, 1996, Ser. No. 595,328
Int. Cl.[6] A61N *1/362*
U.S. Cl. 128—897 **37 Claims**



1. An internal body pump implantable in a person's body for circulating a fluid in a continuous loop within the person's body, said pump including conduit means for providing a passage for the fluid, said passage being in a continuous circulating loop including portions capable of being located in areas of the body having different internal pressure levels, with the pressure level varying in at least one of said areas of the body due to breathing activity of a person, said conduit means including at least one pressure responsive section locatable in an area of the body in which a varying pressure level occurs due to the breathing activity of the person in whom the pump is implantable, said pressure responsive section being responsive to said varying pressure level so as to be capable of transmitting varying pressure from said area of the body to the fluid within the pressure responsive section for causing the fluid to move in a continuous circulating loop of the pump.

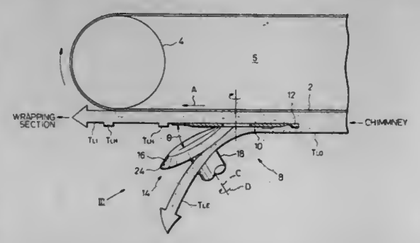
5,813,411
METHOD OF DEFORMING TISSUE WITH A SWOLLEN HYDROGEL
Kevin H. Van Bladel, San Mateo; Robert S. Bley, Menlo Park, and John D. Wallace, Fremont, all of Calif., assignors to Menlo Care, Inc., Menlo Park, Calif.
Filed Aug. 20, 1996, Ser. No. 700,004
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—898 **21 Claims**

1. A method of deforming a selected tissue structure comprising inserting into tissues adjacent the selected tissue structure the



physiologically acceptable composition comprising a plurality of physiologically acceptable hydrogel particles which consist essentially of crosslinked polymers selected from the group consisting of polyethylene oxide polymer or copolymer, a polyvinylpyrrolidone polymer or copolymer, a polyvinyl alcohol polymer or copolymer, a pHema polymer or copolymer, a Hypan polymer or copolymer, a dextranomer polymer or copolymer, a starch glycolate polymer or copolymer salt, a polyacrylic acid polymer or copolymer, and a polyacrylamide polymer or copolymer that have been swollen by an aqueous medium and contain a low molecular weight water soluble organic compound, the concentration of the organic compound being such that the resulting particle require application of an injection force of significantly less than when no organic compound is present, the swollen hydrogel particles being substantially insoluble in body fluids to deform said selected tissue structure.

5,813,412
DEVICE FOR TRIMMING SHREDDED TOBACCO LAYER FORMED IN CIGARETTE MANUFACTURING MACHINE
Yutaka Okumoto, Tokyo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan
Filed May 29, 1997, Ser. No. 864,912
Claims priority, application Japan, May 29, 1996, 8-135068
Int. Cl.[6] A24C *5/39*
U.S. Cl. 131—84.4 **4 Claims**

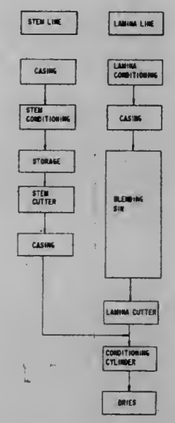


1. A device for trimming a shredded tobacco layer formed in a cigarette manufacturing machine, comprising:

a trimming disk rotatably arranged in a vicinity of a suction band which forms and transports the shredded tobacco layer, said trimming disk continuously cutting into the shredded tobacco layer during the rotation thereof, thereby dividing the shredded tobacco layer into a required layer portion and a surplus portion; and

removing means for removing the surplus portion of the shredded tobacco layer in cooperation with said trimming disk, said removing means including a rotatable peeling disk, said peeling disk having a peeling blade formed at a peripheral edge portion thereof to extend continuously in a peripheral direction, said peeling blade being movable in a plane inclined with respect to a lower surface of the trimming disk while keeping contact with the lower surface of said trimming disk, and a flat end face for guiding the removed surplus portion.

5,813,413
METHOD AND PLANT FOR TREATING TOBACCO LEAVES FOR THE PRODUCTION OF CUT TOBACCO
Wolfgang Metzner, Hamburg; Bernd Spallek, Syke, and Arno Weiss, Norderstedt, all of Germany, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Nov. 19, 1996, Ser. No. 752,626
Claims priority, application Germany, Nov. 20, 1995, 195 43 263.0
Int. Cl.[6] A24B *3/07*
U.S. Cl. 131—109.1 **21 Claims**



1. A method of treating tobacco leaves for the production of cut tobacco for smokable articles, comprising:

providing unrolled and cut stems which have been conditioned to provide a moisture content of between about 22–26% moisture and a width of between about 0.1–0.3 mm, and conditioned and cut lamina which have been conditioned to provide a moisture content of between about 17–25% moisture and a width of between about 0.5–2 mm;

blending said unrolled and cut stems after said conditioning with said conditioned and cut lamina;

conditioning said resultant blend to adjust the moisture content of the blend to between about 18 to 39% moisture; and

drying said conditioned blend to a moisture content of between about 13–16% moisture.

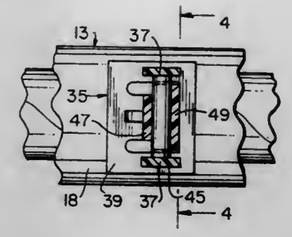
5,813,414
GOLF STAND
Michael Zutler, Woodbury; Robert Kipnes; John Klein, both of Jericho; Bruce Zutler, Port Washington, and Aaron Zutler, Woodbury, all of N.Y., assignors to MCI Products Group, Inc., Plainview, N.Y.
Filed Jan. 23, 1997, Ser. No. 786,322
Int. Cl.[6] A63B *55/04;55/10*
U.S. Cl. 131—241 **10 Claims**

1. A stand assembly comprising:

a post member having a first end for selective reception in the ground and a second end;

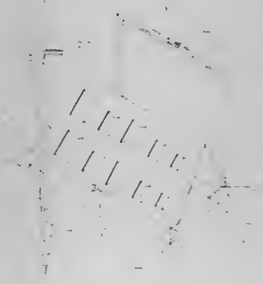
a support member having first and second ends;

wherein said second end of said post member is pivotally connected to said support member between said support member's first and second ends such that said support member can pivotally rotate to a plurality of positions between a first position substantially perpendicular with respect to said post member and a second collapsed position substantially parallel to said post member;



wherein said pivotal connection includes a pivot bracket fixed to said support means and pivotally rotatable about a pivot pin fixed to said post member at its second end.

5,813,415
NAIL EASEL DETAILING AND STORAGE KIT FOR PREPARING ARTIFICIAL FINGERNAILS
Susan Slali, P.O. Box 427, Sarasota, Fla. 34230-0427
Filed Mar. 21, 1998, Ser. No. 45,229
Int. Cl.[6] A45D *29/00*
U.S. Cl. 132—73 **5 Claims**



1. A convenient, self-contained appliance allowing the user to apply nail polish and ornamentation to a multitude of artificial fingernails, comprising:

a case of durable, washable material of sufficient size to provide a storage area for nail polishing and ornamentation supplies with a detachable lid and sufficient number of support posts secured into the bottom surface of the case for supporting, elevating and positioning the nail polish and ornamentation application device;

wherein at least two forward said support posts having at least one set of parallel, indented grooves for supporting and positioning the nail polish and ornamentation application device;

a removable nail polish and ornamentation application device having a front and a rear panel with a multitude of secured, convexed nail members of substantially disparate dimensions to mimic the structure and dimension of at least a full set of human fingernails attached to a full, flat surface of said panel;

said members are specifically shaped and dimensioned to receive and retain at least a full set of artificial fingernails and provide elevation of at least a full set of artificial fingernails for precision polishing and ornamentation.

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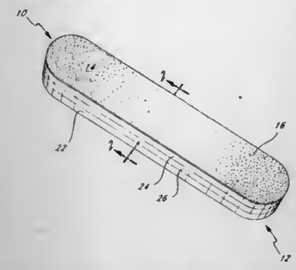
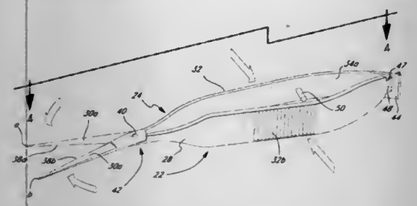
5,813,416
FILE WITH SANITIZING AGENT
James M. Rudolph, 1150 Beacon St., Brea, Calif. 92621
Filed Apr. 3, 1997, Ser. No. 832,219
Int. Cl.[6] A45D *29/04*
U.S. Cl. 132—76.4 **5 Claims**



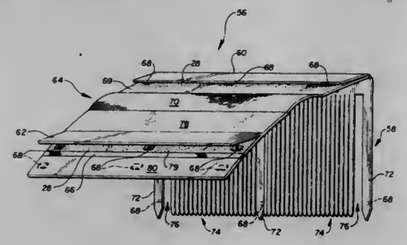
1. A method of treating a human nail to inhibit or prevent infection comprising
(a) filing the nail with a file including a support member having an abrasive surface, said surface having interstices which are at least partially filled with a sanitizing agent that is released upon use of the file, and
(b) applying sufficient pressure during filing to release the sanitizing agent, so that said sanitizing agent contacts the nail being filed.

5,813,417
HAIR CUTTING METHOD
James M. Rudolph, 1150 Beacon St., Brea, Calif. 92621
Filed Oct. 7, 1997, Ser. No. 946,556
Int. Cl.[6] A45D *24/00*
U.S. Cl. 132—200 **6 Claims**



1. A hair cutting method including
(a) positioning strands of hair between normally open blade ends of a scissors having
a pair of elongated members, each member having a blade end, a intermediate gripping section, and a spring end, and each blade end having a cutting edge,
said members being connected to each other by a pivot element disposed near a junction where the blade ends and intermediate gripping sections join, and
said spring ends each having tips which are connected together to bias said elongated members so that the blade ends move about the pivot element into a normally open position,
said blade ends coming together in a cutting fashion with their cutting edges engaging upon the user grasping both intermediate gripping sections between the user's thumb and a finger of the user and pressing said intermediate gripping sections towards each other, said blade ends returning to the normally open position upon the user relaxing his or her grasp of said intermediate gripping sections,
(b) grasping both intermediate gripping sections between the user's thumb and a finger of the user and pressing said intermediate gripping sections towards each other to bring the cutting edges into engagement to cut said strands of hair, and
(c) relaxing the grip of the intermediate gripping sections while still holding the scissors to allow the blade ends to return to the normally open position,
thereby allowing the user to reposition the scissors to cut additional stands of hair as desired.

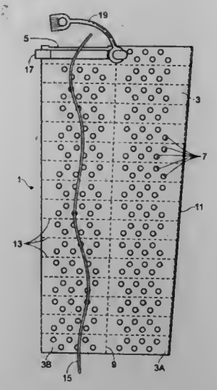
5,813,418
HAIR CLIP DEVICE AND METHOD FOR ATTACHING HAIR EXTENSIONS
Selina M. Pillars, 6731 Arlington Ave., Los Angeles, Calif. 90043
Filed Nov. 7, 1997, Ser. No. 965,778
Int. Cl.[6] A41G *3/00;5/00*
U.S. Cl. 132—201 **20 Claims**



1. A hair clip device for adding hair extensions comprising:
a flexible curved comb element having a unitary top edge along its length with long comb teeth extending from said top edge;
a flexible cover element hinged to the top edge of and coextensive in area with said comb element, said cover element having a median region for accommodating space for braided hair;
a first flexible hair extension holder having short pins on its underside which cooperate with short pins on said comb element, and hinged to the top edge of said cover element; and
a second flexible hair extension holder having short pins on its underside which cooperate with short pins on said comb element, and hinged proximate to the bottom edge of said cover element;
whereby a user's hair is trapped by said comb element and said cover element for attachment of hair extensions under said hair extension holders.

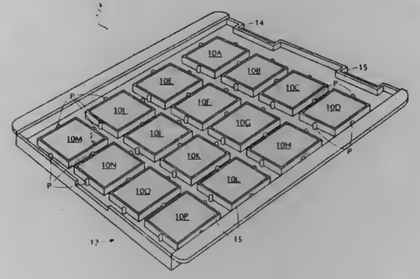
5,813,419
HAIR CURLER
Patrick Brams, Rue Dieu-le-Garde 3, B-4280 Villers-le-Peuplier, Belgium
Filed Jan. 31, 1997, Ser. No. 792,278
Claims priority, application Belgium, Jan. 31, 1996, 09600091
Int. Cl.[6] A45D *2/00*
U.S. Cl. 132—222 **18 Claims**

1. A hair-shaping device comprising: a sheet provided with perforations which has been folded a first time lengthwise forming



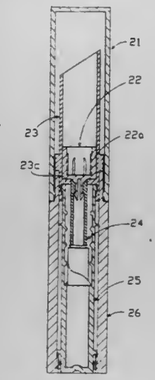
a central fold and then folded in zigzag perpendicularly to said central fold.

5,813,420
COSMETIC MAKE-UP KIT WITHH REPLACEABLE MODULES
Morris Sussman, 50 Doxsee Dr., Freeport, N.Y. 11520
Filed Oct. 6, 1997, Ser. No. 944,861
Int. Cl.[6] A45D *33/26*
U.S. Cl. 132—294 **8 Claims**



1. A kit housing an assortment of cosmetics comprising:
A. a plurality of miniature rectangular modules, each module having four sides and storing a different cosmetic;
B. a case having spaced sites therein to seat said modules; and
C. a frame plate hinged to said case having a like plurality of rectangular openings which when the frame plate overlies said case the plate then frames the respective modules in the case and holds them in place whereby to replace a module whose cosmetic is exhausted, it is only necessary to raise the frame plate and substitute at the site of the exhausted module a fresh module, each site in the case being defined by guide pins anchored in the case to abut the sides of the module seated at the site, the pins defining said site being a set of four pins at the corners of a diamond, each pin abutting a respective side of the rectangular module at its midpoint.

5,813,421
LIPSTICK SWIVEL MECHANISM
Chun Te Wang, Hsin-Chu, Taiwan, assignor to Der Kwei Cosmetic Packaging Co., Limited, Hsin Chu, Taiwan
Filed Jul. 9, 1997, Ser. No. 891,619
Int. Cl.[6] A45D *40/06*
U.S. Cl. 132—318 **2 Claims**



1. A lipstick swivel mechanism comprising:
a cup having a cup body for holding a lipstick bullet;
a nosepiece for containing said cup and guiding said cup to move upward or downward;
a spiral rotatably connected to said nosepiece, having helical guiding grooves formed on the inner surface thereof;
a screw received within said spiral and detachably connected to said cup;
a base for containing said spiral;
characterized in:
that said cup has at least two separate elastic barbs integrally formed at the bottom surface of said cup body and capable of slight radial deflection, and a first bevelled engaging portion constituted by a plurality of bevelled ribs disposed around the connecting area of said barbs with the bottom surface of said cup body; and
that said screw has: a second bevelled engaging portion, constituted by a plurality of bevelled grooves, disposed around the top of said screw, for guiding the insertion of said barbs of said cup into said screw upon assembling and for engaging with said first bevelled engaging portion to prevent relative rotation between said cup and said screw; a stepped portion for stopping said barbs of said cup, which is inserted into said screw, to avoid unintentional detaching of said cup from said screw; double helical protrusions, formed on the outer surface of said screw, received in and guided by said helical guiding grooves inside said spiral so as to make said screw and said cup move upward or downward when said spiral is rotated.

5,813,422
CLEANING DEVICE FOR AN EMISSION
Kenneth G. Beck, 80 E. Surrey La., Barrington Hills, Ill. 60010
Filed Feb. 5, 1996, Ser. No. 596,474
Int. Cl.[6] B08B *3/04;9/00*
U.S. Cl. 134—111 **12 Claims**

1. A device for cleaning an emission testing apparatus, the device being suitable for use with a low volume solenoid structure in the emission testing apparatus and being adapted to propel a cleaning fluid through the emission testing apparatus, the device comprising:
(a) a power source, a fluid flow direction means being connected to a fluid flow force means and the power source, and a

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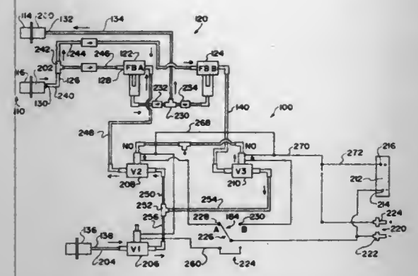


connecting means for attaching the device to the emission testing apparatus at the fluid flow direction means;

(b) a filtering means being connected between the fluid flow force means and the fluid flow direction means;

(c) the fluid flow direction means further including a propelling means selected from the group consisting of a vacuum source and pressure source;

(d) the fluid flow direction means further including a pump;

(e) the propelling means being connected to the pump;

(f) the filtering means being connected to the pump;

(g) the propelling means being connected to the power source;

(h) the filtering means including a first filter bowl and a second filter bowl;

(i) the first filter bowl being used with a pressure source; and

(j) the second filter bowl being used with a vacuum source.

5,813,423

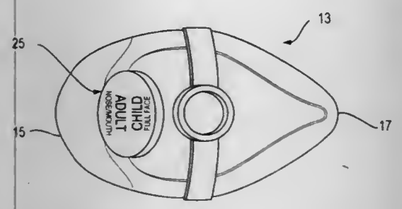
INHALATOR AND/OR RESUSCITATOR MASK ADAPTABLE FOR USE WITH AN ADULT AND CHILD

John Kirchgeorg, 1776 N. Water St. P.O. Box 3000, Milwaukee, Wis. 53201

Continuation of Ser. No. 551,612, Nov. 1, 1995, abandoned. This application Oct. 24, 1996, Ser. No. 736,589

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—202.28 **12 Claims**



1. A bi-orientatable mask capable of delivering a gas to a victim or patient, comprising:

a mask body of flexible material;

at least two sets of indicia provided on said mask body;

said sets of indicia each providing both an axis of orientation and a size or shape designator, said indicia being arranged such that when said mask is correctly oriented on said-patient or victim, the size or shape designator of only one of said sets of indicia is oriented such that the size or shape of said patient or victim is accurately indicated.

5,813,424

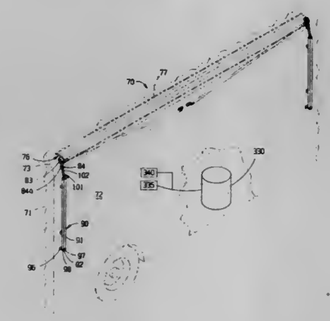
AUTOMATIC AWNING FOR RECREATIONAL VEHICLE

Louis Simonetti, Elk Groove, Ill., assignor to Zip Dee, Inc., Elk Grove, Ill.

Division of Ser. No. 465,975, Jun. 6, 1995, Pat. No. 5,597,006. This application Jan. 7, 1997, Ser. No. 779,490

Int. Cl.[6] E04F *10/00*

U.S. Cl. 135—88.1 **5 Claims**



1. In a recreational vehicle having an awning material connected thereto and to a roller assembly wherein said roller assembly is movable between a stored position wherein said awning material is wrapped around said roller assembly and is positioned adjacent the recreational vehicle and an extended position wherein said awning material extends away from the recreational vehicle, mechanism for providing energy to said roller assembly to effectuate movement of said roller assembly between the extended and the stored positions thereof, two support arm assemblies, each being mounted at one end thereof to the recreational vehicle and at the other end to said roller assembly, said support arm assemblies being movable between a stored position thereof wherein said support arm assemblies are close and generally parallel to the side of the recreational vehicle and an extended position wherein said support arm assemblies extend away from the recreational vehicle, pneumatic mechanism for assisting said support arm assemblies to an extended position thereof when said roller assembly is moving to the extended position thereof, mechanism including channels within said support arm assemblies for connecting said pneumatic mechanism to a source of pneumatic fluid, and control mechanism for connecting energy to said roller assembly and pneumatic fluid to the support arm assemblies during movement of the roller assembly between the stored and extended positions thereof.

5,813,425

COLLAPSIBLE SHELTER WITH ELEVATED CANOPY

Mark C. Carter, 10131 Kernwood Ct., Alta Loma, Calif. 91737

Continuation of Ser. No. 552,091, Nov. 2, 1995, Pat. No. 5,632,292, and a continuation-in-part of Ser. No. 42,996, Apr. 5, 1993, Pat. No. 5,490,533. This application Mar. 25, 1997, Ser. No. 823,589

Int. Cl.[6] E04H *15/50*

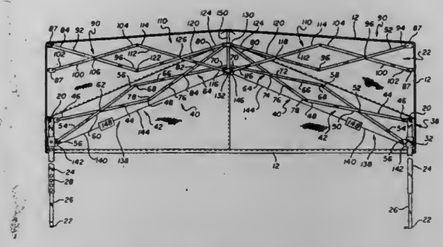
U.S. Cl. 135—145 **7 Claims**

1. A collapsible shelter, comprising:

a canopy;

a leg assembly supporting said canopy;

a plurality of central truss pairs of link members of unequal length connected together in a scissors configuration so as to be extendable from a first collapsed position not extending above said leg assembly to a second extended position extending above said leg assembly; and



a perimeter truss linkage assembly connected to said leg assembly, and connecting said plurality of central truss pairs of link members to said leg assembly.

5,813,426

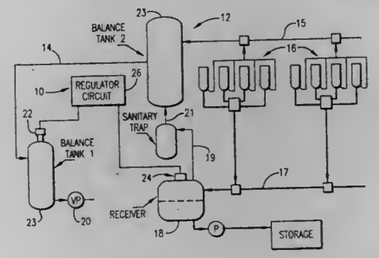
VACUUM REGULATOR

Jinglu Tan, Columbia, Mo., and Limin Wang, Springfield, Ill., assignors to University of Missouri, Columbia, Mo.

Division of Ser. No. 484,470, Jun. 7, 1995, Pat. No. 5,613,514. This application Sep. 4, 1996, Ser. No. 707,387

Int. Cl.[6] G05D *16/20*

U.S. Cl. 137—14 **10 Claims**



1. A method of controlling the pressure of a pressure system having pumping means for adding fluids to or removing fluids from the pressure system, a dynamic pressure responsive working station requiring compressed or expanded fluids at a steady pressure, and means operably coupling the pumping means and working station for conveying the fluids to or removing the fluids from the working station for operating the working station, the pressure system being subject to pressure disturbances resulting from variable fluid usage by the working station which can adversely affect the operation of the working station, the pressure system further having a valve having a fully open, a fully closed and a plurality of intermediate valve positions, said method comprising the steps:

measuring the pressure of the pressure system; and

maintaining the pressure of the pressure system in a desired pressure range to compensate for the pressure disturbances, said maintaining step including the steps—

comparing the measured pressure with a pre-determined set-point; and

positioning the valve, in response to said comparing step, to respective ones of said intermediate valve positions between said fully open and fully closed positions for letting selective amounts of fluid into or out of the pressure system for maintaining the pressure of the pressure system in said desired pressure range.

5,813,427

COUNTER-CURRENT CHECK DEVICE FOR A CANISTER IN AN AUTOMOBILE

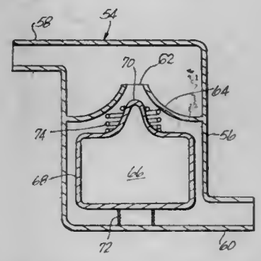
Kyung Sun Huh, Kyungkido, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 3, 1996, Ser. No. 760,162

Claims priority, application Rep. of Korea, Dec. 4, 1995, 1995-46401

Int. Cl.[6] I16T *1/20*

U.S. Cl. 137—202 **3 Claims**



1. A device for preventing liquid from flowing into a canister of an automobile, the device comprising:

a casing of a substantially cylindrical configuration having an inlet and an outlet, said outlet being connected to an atmospheric vent pipe of said canister and said inlet being connected to the atmosphere;

a funnel-shaped plate fastened to an inner surface of said casing and having a venting port formed in a center of the funnel-shaped plate;

a bladder positioned below said funnel-shaped plate, having a gating portion fittable to said venting port of said funnel-shaped plate; and

biasing means automatically operative when liquid from the inlet acts on said bladder for urging said gating portion of said bladder against said venting port of said funnel-shaped plate.

5,813,428

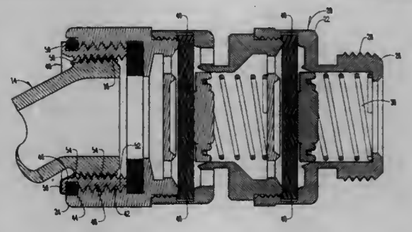
COMBINATION WALL HYDRANT AND BACKFLOW PREVENTOR

Lawrence Almasy; James F. Shuler, and Robert J. Vandepas, all of Colorado Springs, Colo., assignors to WCM Industries, Inc., Colorado Springs, Colo.

Filed May 16, 1996, Ser. No. 648,622

Int. Cl.[6] E03C *1/10*

U.S. Cl. 137—218 **12 Claims**



1. A backflow preventor for faucets, comprising,

a hollow body member having an inlet end and an outlet end,

a fluid backflow preventor assembly in said body member to permit fluid flow through said body member towards said outlet end and to prevent fluid flow through said body member towards said inlet end,

male threads on the exterior of said outlet end of said body member for threadable insertion into female threads of a hose,

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interior female threads in said inlet end of said body member,

a cylindrical bushing adapter having opposite interior and exterior surfaces and being removably mounted within the inlet end of said body member,

first threads on the exterior surface of said bushing adapter and being threadably compatible and threadably engaged with the interior female threads on said inlet end of said body member,

second threads on the interior surface of said bushing adapter and having a thread size different than said first threads,

a seal element is mounted on the inlet end of said body member adjacent an inlet end of said bushing adapter to seal the threadline formed by the threadable engagement of the interior female threads on the inlet end of said body member and said first threads on the exterior surface of said bushing adapter,

said seal element being a resilient O-ring mounted in registering annular grooves in said body member and said bushing adapter.

5,813,429

COMPRESSED NATURAL GAS CHARGING SYSTEM

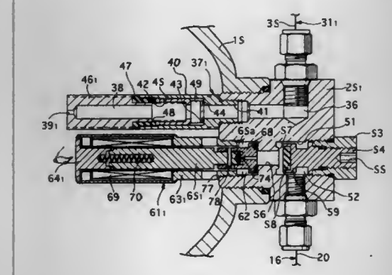
Akifumi Ohtaka; Hiroshi Shimanuki; Hiromi Matsuura, and Masayuki Tsuchiya, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1996, Ser. No. 606,000

Claims priority, application Japan, Jan. 31, 1996, 8-015485

Int. Cl.[6] F16K *17/38*

U.S. Cl. 137—266 **13 Claims**



2. A compressed natural gas charging system comprising a gas charging passageway having one end capable of being connected to a compressed natural gas supply means capable of supplying a compressed natural gas and another end opening into a plurality of gas vessels, a single one-way valve incorporated in the gas charging passageway to permit the compressed natural gas to flow from said one end of the gas charging passageway toward said another end, said gas charging passageway comprises a main passage section in which said single one-way valve is provided, said main passage section being connected to one of said gas vessels, a connecting passage section connected to said main passage section at a location downstream of said one-way valve to connect said gas vessels to one another, and passage branches provided in said gas vessels, respectively, one end of each of said passage branches communicating with said connecting passage selection and the other end of said passage branch opening into said gas vessel, each of said passage ranches including a shut-off valve which is incorporated therein and has a constriction degree in an opened state of said shut-off valve smaller than that of said single one-way valve, and said constriction is provided in each of said passage branches at a location downstream of said shut-off valve.

5,813,430

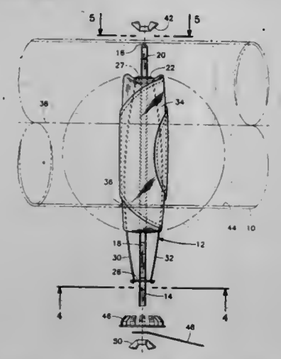
ADJUSTABLE DUCT DAMPER

Arthur P. De Leon, 2179 Fitzgerald Rd., Simi Valley, Calif. 93065

Filed Mar. 7, 1997, Ser. No. 813,661

Int. Cl.[6] F16K *1/22*

U.S. Cl. 137—318 **12 Claims**



1. A damper to be installed into a fluid conducting duct to restrict the flow of fluid through the duct, said damper comprising:

an elongated rod having an outer end and an inner end, a fixed member fixedly mounted on said elongated rod directly adjacent said outer end, a movable member movably mounted on said elongated rod directly adjacent said inner end;

a frame mounted on said fixed member and said movable member and extending therebetween, said frame being expandable from a collapsed position to an extended position, said collapsed position locating said frame substantially parallel to said elongated rod and directly adjacent to said elongated rod, said extended position locating said frame in a bowed configuration relative to said elongated rod, said frame being movable between said collapsed position and said extended position by moving of said movable member;

a thin sheet material cover mounted on said frame, said cover being flexible, said cover closely conforming about said frame when said frame is in said extended position, said cover being wrappable about said frame when said frame is in said collapsed position, whereby a pair of aligned holes are formed within the duct and with the frame in said collapsed position and said cover wrapped around said frame the said frame and said cover are inserted through one of the holes and totally located within the duct and the said outer end is to engage with the other of said holes, whereby said movable member is then moved causing said frame to be located in said extended position, whereby said frame and said cover in said extended position is to be pivotable relative to the duct and fixable in any established position between a position substantially closing the duct to an open position essentially not restricting of fluid flow through the duct; and

locking means mounted on said elongated rod, said locking means for maintaining said frame in said extended position and fixing of said frame.

5,813,431

SHOWER MOUNTING PLATE

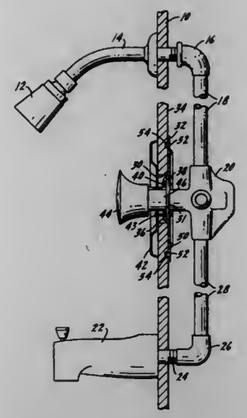
Lonnie F. Cool, North Olmsted, and Robert G. Schmedding, Strongsville, both of Ohio, assignors to Moen Incorporated, North Olmsted, Ohio

Filed Dec. 22, 1997, Ser. No. 995,628

Int. Cl.[6] F16L *5/00*

U.S. Cl. 137—360 **5 Claims**

1. A water valve mounting assembly for use in attaching a water valve to a wall of a room having washing facilities, said assembly including a valve body positioned on an exterior side of the wall, which wall has an opening in alignment with the valve body, a mounting plate positioned on the exterior side of the wall and aligned with the valve body and wall opening, said mounting plate being attached to said valve body and having a generally central recessed area extending toward and into the wall opening, said mounting plate having a plurality of spaced, outwardly extending barbs adjacent its periphery, said barbs extending toward and being embedded in the exterior surface of the wall peripherally about the wall opening, said embedded barbs preventing turning movement of the mounting plate relative to the wall.



5,813,432

AUTOMATIC SHUT-OFF VALVE ARRANGEMENT

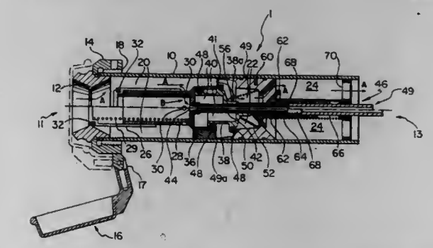
Stanley Robert Elsdon, Islington; Gordon Elford Fairles, Toronto, and Arthur S. Cornford, Mississauga, all of Canada, assignors to Emco Wheaton Fleet Fueling Corp., Oakville, Canada

Continuation-in-part of Ser. No. 167,222, Dec. 14, 1993, abandoned. This application Nov. 4, 1994, Ser. No. 334,205

Claims priority, application Canada, Nov. 5, 1993, 2.102.569

Int. Cl.[6] F16K *31/18;31/34*

U.S. Cl. 137—413 **7 Claims**



1. An automatic shut-off valve for use in fluid transfer operations, comprising:

a valve body having an inlet end and an outlet end;

mounting means for mounting said valve body to an opening of a fluid container so that fluid entering the container must pass through said valve body;

first valve means for permitting fluid to enter said inlet end of said valve body;

main valve means, downstream of said first valve means within said valve body, for precluding fluid flow through said valve body when closed, said main valve means comprising:

a piston;

a volume chamber, expansion of which will extend said piston to close said main valve means;

a metering tube for metering fluid from a location upstream of said main valve means to a location that is downstream of said main valve means;

a bleed tube, positioned about said metering tube, defining in part a bleed passage, said metering tube and said bleed tube further defining a passage therebetween that is in communication with said volume chamber; and

level sensor flow control means for restricting flow through said bleed passage, whereby back pressure will develop within said bleed tube, and fluid will build up in said bleed tube and be introduced into said volume chamber through said passage that is defined between said metering tube and said bleed tube, thereby closing said main valve means.

5,813,433

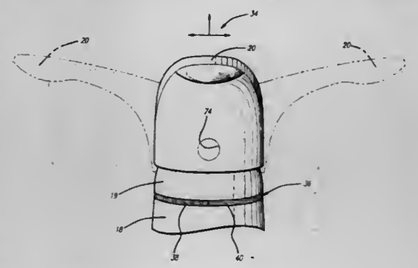
FAUCET WITH CODE ELEMENT

Jonathan Oswaks, Westlake Village; Jean-Pierre Durand, Los Angeles, and Peter Y. Carris, Pasadena, all of Calif., assignors to Emhart Inc.,, Newark, Del.

Filed Aug. 9, 1996, Ser. No. 694,920

Int. Cl.[6] F16K *37/00*

U.S. Cl. 137—553 **13 Claims**



1. In a faucet, which comprises:

a housing;

a color code element mounted on the housing; and

a cover located over at least a portion of the color code element and mounted on the housing so that the color code element is held fixedly between the housing and the cover.

5,813,434

EVAPORATIVE FUEL PROCESSING DEVICE

Masaaki Horiuchi; Takeaki Nakajima, and Kazumi Yamazaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1996, Ser. No. 729,918

Claims priority, application Japan, Oct. 13, 1995, 7-265888

Int. Cl.[6] F16K *24/04*

U.S. Cl. 137—587 **4 Claims**

1. An evaporative fuel processing device comprising:

a fuel tank;

a canister which absorbs evaporative fuel;

a first evaporative fuel conduit which connects the fuel tank to the canister during refueling;

an on-off valve located in an intermediate portion of the first evaporative fuel conduit between the fuel tank and the canister, said on-off valve being in an on position during refueling to open the first evaporative fuel conduit;

a float valve provided at one end of said first evaporative fuel conduit, said float valve is closed by rising of the liquid level

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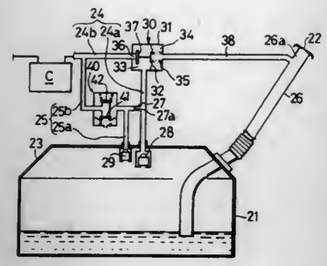


in the fuel tank to cut off the connection between the first evaporative fuel conduit and the fuel tank;

a second evaporative fuel conduit which connects the fuel tank to the canister during non-refueling and which bypasses said on-off valve; and

a communication passage which connects said first evaporative fuel conduit to said second evaporative fuel conduit at an intermediate location between the on-off valve and the float valve.

5,813,435

SINGLE HANDLE MIXING VALVE WITH AN IMPROVED BALL VALVE

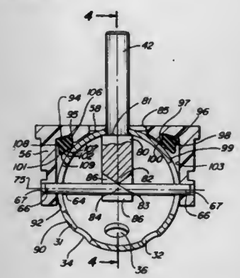
Alfons Knapp, Klockstr, Germany, assignor to Masco Corporation, Taylor, Mich.

PCT No. PCT/US95/01612, § 371 Date Jul. 11, 1997, § 102(e) Date Jul. 11, 1997, PCT Pub. No. WO96/24793, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 6, 1995, Ser. No. 875,333

Int. Cl.[6] F16K *27/08*

U.S. Cl. 137—625.41 **51 Claims**



1. In a faucet mixer valve having a movable ball valve element mounted in a housing body that defines a cavity, said body having a plurality of inlet ports and an outlet port in fluid communication with said cavity, said ball valve element cooperating with said inlet ports to control liquid flow in both flow rate and temperature mix through said ports, said ball valve body having a control opening therethrough, said valve element having a control stem connected thereto and extending through said control opening, the improvement characterized by:

said mixer valve being in cartridge form with a cartridge having a housing member;

said cartridge housing member having an upper opening for allowing said control stem passing therethrough;

said cartridge having a lower opening through which said movable ball valve element protrudes into said recess in said housing body to be cooperative with said inlet ports;

said cartridge housing having a seal seat about said upper opening;

a sealing gasket seated in said seal seat about said upper opening in said cartridge housing and sealingly abuttable against said movable ball valve element;

said ball valve having a first arcuate slot therethrough substantially aligned with a great circle of said ball;

a shaft being journaled in said cartridge against any lateral sliding motion and extending through said slot of said ball, said ball being rotatable about an axis of said shaft at a point where said shaft extends through said slot of said ball;

said shaft extending into the interior of said ball valve;

a brace affixed against an upper section of said ball valve and extending to and abutting the shaft to provide a support to prevent the ball from dropping out of the lower opening of said cartridge.

5,813,436

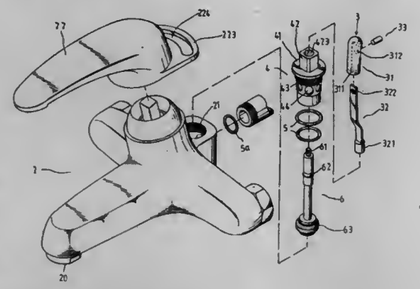
FAUCET DEVICE

Chiao-Lin Chen, 3, Lane 230, Dong Kuang Rd., Her Meei, Chang Hua Hsien, Taiwan

Filed Jul. 7, 1997, Ser. No. 888,869

Int. Cl.[6] E03C *1/04;* **F16K** *11/14*

U.S. Cl. 137—801 **2 Claims**



1. A faucet device comprises:

a main body,

a handle disposed on the main body,

a positioning hole formed on the main body,

a plunger inserted in the positioning hole,

a valve seat covering the positioning hole,

a control device connected to the valve seat,

the handle having a lateral seat and a slot hole,

the main body having a water outlet, a water passage communicating with the water outlet, a water inlet opening communicating with the water passage, a water channel communicating with the water inlet opening, and a water inlet hole communicating with the positioning hole,

the plunger having a threaded end, a packing ring, and a plug packing disposed on a lower end of the plunger,

the valve seat having a flange, a cubic portion disposed on the flange, a threaded portion formed on a periphery of the valve seat, a plurality of circular holes formed on the periphery of the valve seat, and a through hole,

the plunger inserted through the through hole and an upper portion of the plunger extended out of the valve seat,

a washer surrounding the threaded portion and being blocked by the flange,

the plug packing plugging a lower end of the valve seat,

the control device having a hollow head and a control rod,

the hollow head having an interior and a pin hole,

an upper portion of the control rod inserted in the interior of the hollow head,

the upper portion of the control rod passing through the slot hole,

the control rod having a round hole matching the pin hole and a cylinder end engaging with the threaded end of the plunger, and

a pin fastening the hollow head and the control rod via the pin hole and the round hole.

5,813,437

PIPE FOR CONVEYING SOLIDS

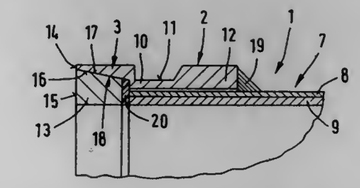
Alexander Esser, Warstein, Germany, assignor to Esser-Werke GmbH & Co. KG, Warstein, Germany

Filed Feb. 7, 1996, Ser. No. 597,908

Claims priority, application Germany, Mar. 14, 1995, 295 04 332 U

Int. Cl.[6] F16L *9/04*

U.S. Cl. 138—109 **7 Claims**



1. In a pipe for conveying solids, the pipe including a cylindrical middle portion having ends, a welding neck with a coupling ring flange welded onto the ends of the middle portion, the welding neck having an inner layer and an outer layer, wherein the inner layer is of a material which has a greater resistance to wear than the outer layer, the inner layer and the outer layer having end faces, the end faces of the inner layer and the outer layer extending in a common transverse plane, the improvement comprising the inner layer being of ceramic material, and further comprising a glued connection of an entire surface of the inner layer in an internal groove of the coupling ring flange.

5,813,438

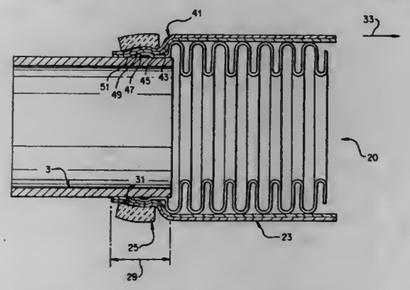
BRAIDED CONDUIT AND METHOD OF MAKING A BRAIDED CONDUIT

Edward A. Reed, Waco, Tex., assignor to Packless Metal Hose, Inc., Waco, Tex.

Filed Apr. 28, 1994, Ser. No. 236,217

Int. Cl.[6] F16L *33/26*

U.S. Cl. 138—121 **134 Claims**



1. A conduit covered with a braid, comprising:

a section of flexible convoluted conduit comprising a plurality of convolutions and an end having an outer surface;

a braid covering the section of conduit and having a portion cold formed onto an outer surface of the end;

at least a portion of a grip ring substantially surrounding at least part of the portion of the braid, the portion of grip ring being cold formed onto the braid in a cold formed connection such that the part of the portion of braid is held by friction in a cold formed connection between a portion of grip ring and an outer surface of the end.

5,813,439

FLEXIBLE TUBULAR PIPE COMPRISING AN INTERLOCKED ARMORING WEB AND PROCESS FOR PRODUCING IT

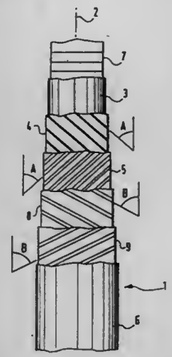
José Mallen Herrero, 29, Bd des Batignolles, 75008 - Paris, France, and Jany Feret, 14, avenue de l'Europe, 78160 - Marly Le Roi, France

Division of Ser. No. 249,350, May 27, 1994, Pat. No. 5,645,109, which is a continuation of Ser. No. 835,978, Mar. 31, 1992, abandoned. This application Sep. 4, 1996, Ser. No. 706,289

Claims priority, application France, Jun. 29, 1990, 90 08298

Int. Cl.[6] F16L *1/08*

U.S. Cl. 138—134 **4 Claims**



1. A flexible tubular pipe comprising an inner sealing sheath and a plurality of armoring webs surrounding said sheath, each of said armoring webs comprising:

a plurality of wires wound with an angle less than 80° in relation to a central axis of said flexible tubular pipe, winding angles of said wires of said armoring webs being chosen to obtain a balanced flexible tubular pipe, wherein a first inner most armoring web of said plurality of armoring webs includes a plurality of interlockable wires, wherein remaining ones of said plurality of armoring webs disposed outside said first innermost armoring web comprises a plurality of non-interlockable wires.

5,813,440

TAPE HEAD FOR A GRIPPER LOOM

Giulio Bortoli, Schio, and Luciano Corain, Vicenza, both of Italy, assignors to Nuovo Pignone S.P.A., Italy

Filed Feb. 26, 1997, Ser. No. 806,940

Claims priority, application Italy, Feb. 27, 1996, MI.96-A/000364

Int. Cl.[6] D03D *47/20;* **B29C** *45/14*

U.S. Cl. 139—449 **10 Claims**

1. A gripper loom tape head having a flat base and a first plurality of holes therein, said base supporting a prefabricated gripper support crest along a longitudinal axis of said tape head, said gripper support crest having a second plurality of holes arranged along a lower portion of said gripper support crest, transverse to said first plurality of holes; said gripper support crest held in position along said longitudinal axis, spaced from said tape

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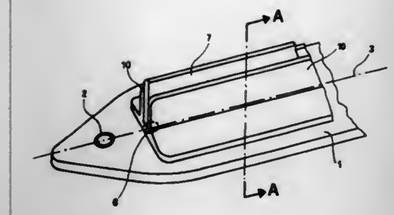


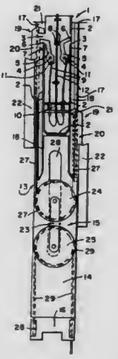
head by thermoplastic material which surrounds a substantial portion of said gripper support crest and which fills said first and second pluralities of holes.

5,813,441

SHED FORMING DEVICE FOR A TEXTILE MACHINE WITH ACTUATOR MEANS

Andre Dewispelaere, Kortrijk/Marke, Belgium, assignor to N.V. Michel Van de Wiele, Kortrijk/Marke, Belgium

Filed Jun. 27, 1997, Ser. No. 835,416
Int. Cl.[6] D03C *3/24*
U.S. Cl. 139—455 **13 Claims**



1. Shed forming device for a textile machine having at least one shed forming mechanism comprising a shed forming means adapted to perform an upward and downward movement, a movable holding element, an actuator connected to the holding element for moving the holding element into a holding position and into a non-holding position, and a stop for stopping the holding element in the holding position, the holding element holding the shed forming means at a fixed height in the holding position, wherein the stop supports the holding element when the element holds the shed forming means at the fixed height, and wherein the holding element is held on the stop by the shed forming means.

5,813,442

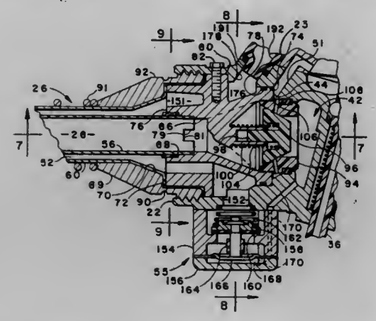
Patent Not Issued For This Number

5,813,443

VAPOR RECOVERY FUEL NOZZLES

Mark D. Dalhart, Hamilton; Paul B. Anderson, Cincinnati, and David A. Damico, Lebanon, all of Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Dec. 7, 1992, Ser. No. 986,521
Int. Cl.[6] B65B *1/04*
U.S. Cl. 141—206 **11 Claims**



2. A vapor recovery, automatic shut off fuel dispensing nozzle comprising

a nozzle body,

a spout projecting from a fuel discharge end of the nozzle body,

fuel passageway means and vapor return passageway means extending, respectively, between an inlet end of the nozzle body and a distal, discharge end of the spout,

said vapor return passageway means, at the inlet end of the nozzle body, being adapted for connection with a vacuum source for drawing vapors from the spout end of the nozzle to a remote disposal site,

a vapor valve interposed in the vapor return passageway means, said vapor valve being closed excepting when there is fuel flow through the fuel passageways means,

means for automatically terminating flow of fuel through the fuel passageway means in response to fuel reaching the level of the spout when the spout is inserted in a fuel tank, fill pipe,

said shut off means including a vacuum chamber disposed in the nozzle body, and venting passageway means extending from the vacuum chamber to the discharge end of the spout,

wherein

the venting passageway means and the vapor return passageway means are sealed from each other,

the venting passageway means has an entrance opening at the distal end portion of the spout, and

the vapor return passage has an inlet opening, at the distal end portion of the spout, spaced from the venting passage entrance opening,

and further wherein

the nozzle body comprises a hand grip portion, and

the fuel passageway means and vapor return passageway means extend from said inlet end through said hand grip portion, and

the vapor return passageway means extend from the spout to the vapor valve and then from the vapor valve to the portion of the vapor return passageway means in the hand grip portion,

the nozzle body has a bore in a fuel discharge end thereof, and

an adapter disposed in said bore in the nozzle body, and

further characterized in that

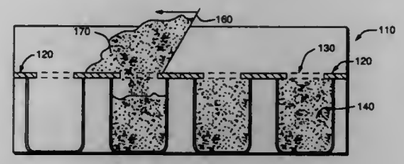
the adapter, in combination with said nozzle body defines portions of said vapor return passageway means leading to the vapor valve and from the vapor valve to an entrance to the vapor return passageway means in said hand grip portion.

5,813,444

APPARATUS AND METHOD FOR FILLING A PLURALITY OF CONTAINERS WITH PARTICULAR MATTER

Donald P. Cashion, 7 Acres St., Box 114 School St., Bennington, N.H. 03442

Filed Dec. 26, 1996, Ser. No. 773,065
Int. Cl.[6] B65B *1/04;3/04;37/00;* **B67C** *3/00*
U.S. Cl. 141—248 **8 Claims**



1. A container filling system for at least partially filling at least a first and second group of a plurality of containers with particulate matter, said container filling system comprising:

a receptacle, for receiving said at least first and second groups of plurality of containers, each of said plurality of containers having an opening, said receptacle having a bottom portion for supporting said plurality of containers;

at least first and second filling members, for positioning above said at least first and second groups of plurality of containers in said receptacle, said first and second filling members including a plurality of apertures, for allowing said particulate matter to pass through said plurality of apertures in said first and second filling members into a corresponding opening in said plurality of containers; and

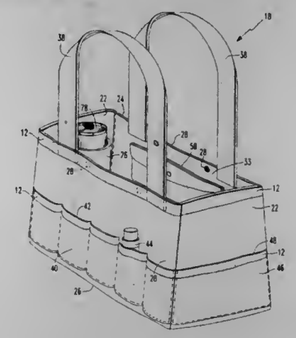
wherein said first and second filling members are positioned adjacent to one another in said receptacle above the corresponding at least first and second groups of said plurality of containers such that said first filling member, and said first group of containers under said first filling member having been filled with particulate matter are removable while said second group of containers under said second filling member are being filled with particulate matter.

5,813,445

BINGO TOTE BAG

Lynn R. Christman, 1101 W. Main St., Grove City, Pa. 16127

Filed Dec. 23, 1996, Ser. No. 772,421
Int. Cl.[6] A45C *3/00;11/32;15/00*
U.S. Cl. 150—106 **20 Claims**



1. A bingo tote bag, comprising:

at least one wall secured together for forming sidewalls and end walls of said bingo tote bag, said wall having a top portion and a bottom portion;

a base member secured to said bottom portion of said wall forming a container having an open end;

at least one first panel attached to said bottom portion of said wall forming a plurality of pockets on each of said sidewalls and at least one pocket on each of said end walls on an exterior surface of said bingo tote bag for storing bingo game accessories;

a second panel attached to an interior surface of said bottom portion of said wall on one of said end walls forming at least one pocket for storing bingo game accessories within said bingo tote bag;

a wallet compartment disposed within said bingo tote bag and secured to said top portion of one of said sidewalls;

a beverage holder including an elongated cylinder formed of a piece of material and having at least one open end, said beverage holder disposed within said bingo tote bag and having said elongated cylinder secured to one of said end walls with said open end facing in the same direction as said open end of said container for insertion and storage of a beverage container in an upright position during use of said bingo tote bag;

a key ring holder secured to at least one of said end walls and said sidewalls; and

a handle attached to said top portion of said wall for carrying said bingo tote bag.

5,813,446

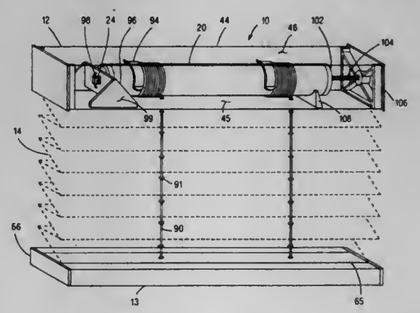
Patent Not Issued For This Number

5,813,447

CORDLESS CELLULAR AND PLEATED SHADE

Phillip A. Lysyj, 8136 Thornhurst Dr., N. Royalton, Ohio 44133

Continuation-in-part of Ser. No. 681,910, Jul. 29, 1996, Pat. No. 5,706,876. This application Apr. 7, 1997, Ser. No. 835,310
Int. Cl.[6] A47H *5/00*
U.S. Cl. 160—84.04 **15 Claims**



1. A cordless shade for a window opening comprising:

a) a head rail containing a bar, said bar having at one end thereof a spring and spring tensioning means for tensioning said spring upon bar rotation in one direction and releasing spring tension upon opposite bar rotation, said releasing accomplished by applying a force rotating said shade bar in said one direction, said bar shorter in length than said head rail and unsecured to said head rail at said one end;

b) a bottom rail adapted to be raised and lowered relative to said top rail;

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c) a shade fabric extending between said head and bottom rails for covering said window, said shade fabric having a cross-sectional configuration which is collapsible when the shade is raised and extendible to a first position when the shade is fully lowered and further extendible to a second position when the shade is to be raised after being fully drawn;

d) at least first and second longitudinally spaced openings extending through said fabric from the bottom to the top of said fabric;

e) at least two lift cords secured to said bottom rail and extending through said fabric openings for raising and lowering said bottom rail relative said top rail; and

f) attachment means for securing said lift bands to said bar so that said lift cords wrap about said bar as said shade is raised and lowered, said attachment means further includes

i) translating means affixed to a first end of said bar for moving said bar longitudinally within said head rail in a first direction upon clockwise rotation of said bar and in a second, opposite longitudinal direction upon counter clockwise rotation of said bar; and

ii) support means associated with the opposite second end of said bar for supporting said opposite end of bar in a movable manner while permitting said spring tensioning means to tension said spring and release said spring tension upon lowering and raising of said bottom rail.

5,813,448

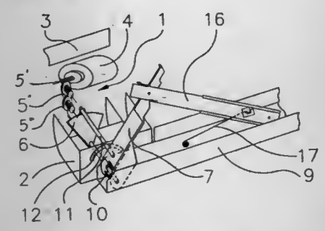
DEVICE FOR SCREENING VEHICLE WINDOWS

Simon Levy, 4219 12th Ave., #3D, Brooklyn, N.Y. 11219

Filed Mar. 13, 1997, Ser. No. 816,923

Int. Cl.[6] B60J *3/02*

U.S. Cl. 160—370.21 **9 Claims**



1. A device for screening vehicle windows, comprising drive means; a carrier turnable by said drive means about a turning axis; and a plurality of elongated screening elements which are turnable by said carrier between a closed position in which all said elongated screening elements are coextensive with one another and an open position in which said elongated screening elements are displaced relative one another to form a fan-like screen, said carrier having at least one pin which is spaced from said turning axis, said elongated screening elements having at least one substantially arcuate slot formed around said turning axis so that said pin can extend through all said slots of said elongated screening elements, said slots of said elongated screening elements having different arcuate length so that in said open position said screening elements are located at different angles from said closed position, said drive means including a motor, a transmission, and a segment connected to said motor through said transmission, said segment being connected with said carrier and being turnable by said transmission so as to turn said carrier about said turning axis.

5,813,449

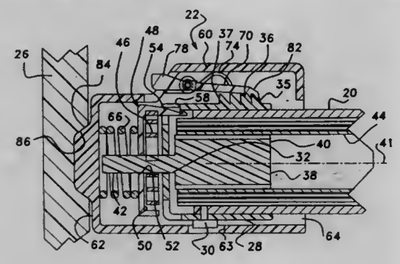
VEHICLE SECURITY SHADE WITH TELESCOPING END PIECES

Kevin M. Patmore, Northville; Jeffrey A. Price, Lakeville, and Michael C. Trombley, Sterling Heights, all of Mich., assignors to Irvin Automotive Products, Inc., Auburn Hills, Mich.

Filed Mar. 19, 1997, Ser. No. 820,603

Int. Cl.[6] A47H *1/00*

U.S. Cl. 160—370.22 **11 Claims**



1. A security shade assembly for a motor vehicle adapted to be installed within said motor vehicle and removably mounted to a pair of separated mounting features within a compartment area of said vehicle interior, said shade assembly comprising:

a shade formed of a flexible sheet material,

a cylindrical roll tube having an edge of said shade mounted thereto and adapted to enable said shade to be rolled thereon, and

at least one end piece assembly affixed to an end of said roll tube and rotationally supporting said roll tube, said assembly including a first end piece component, a torsion spring coupled to said roll tube and said first end piece component thereby rotationally biasing said roll tube, a second end piece component slidably over fitting said first end piece component and moveable axially with respect to said second end piece component from an inner axial position to an outer axial position and having an engagement feature engageable with one of said mounting features to mount said shade assembly, a compression spring acting between said first end piece component and said second end piece component thereby biasing said components axially apart toward said outer position, and latch means including a pawl engageable with a plurality of teeth and biasing means for urging said pawl into engagement with said teeth, said latch means for allowing said second end piece component to move axially away from said first end piece component toward said outer position under the influence of said compression spring and latching said second end piece component at a plurality of relative axial positions where movement of said second end piece component toward said inner axial position is blocked through encagement between said pawl and said teeth, said latch means being disengageable through disengagement between said pawl and said teeth to allow unblocked movement of said second end piece component toward said inner position, said end piece assembly allowing said shade assembly to be mounted between said mounting features with said second end piece component blocked thereby mounting said assembly despite variations in the separation distance between said mounting features.

5,813,450

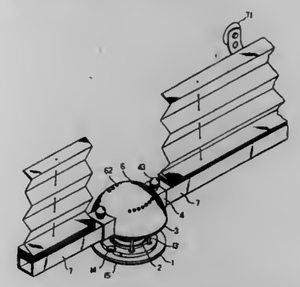
SUNSHADE FOR CAR BACK WINDOW

Ming-Shun Yang, Taipei, Talwan, assignor to Formosa Saint Jose Corporation, Taipei, Talwan

Filed Apr. 9, 1997, Ser. No. 838,718

Int. Cl.[6] B60J *3/00*

U.S. Cl. 160—370.23 **4 Claims**



1. A sunshade for blocking light rough passing through a car, rear window, comprising:

two independent but laterally symmetrical folding blinds (**7**), a mounting means for supporting said blinds on a deck at the rear window of a car, and a cover for said mounting means;

said mounting means comprising a base (**1**) having an upwardly extending threaded stem (**11**) and plural upwardly extending guide rods (**13**); a support seat (**3**) overlying said base; a compression spring (**2**) encircling said threaded stem between said base and said support seat; and a rectangular sleeve (**4**) positioned flatwise on said seat such that opposite ends of said sleeve extend in opposite directions beyond said seat;

said sleeve having a central opening accommodating said threaded stem, and a nut threaded onto said stem to secure said sleeve to said seat;

said seat comprising two separate fragrance compartments (**31**) located alongside said sleeve for containing solid fragrance materials; said seat being slidably supported on said guide rods for vertical adjustments, whereby said seat can be raised or lowered by manually rotating said nut on said threaded stem;

each said folding blind comprising a frame element telescoped into an end of said sleeve, whereby said folding blinds are symmetrically arranged on said mounting means;

said cover being attachable to said support seat so as to overlie said rectangular sleeve and said fragrance compartments; said cover having ventilation holes therein for allowing fragrant vapors to escape from said fragrance compartments.

5,813,451

APPARATUS FOR HEAT TRANSFER FROM DUST LADEN GASES TO FLUIDS

Jogindar Mohan Chawla, Ettlingen, Germany, assignor to Caldyn, Inc.

Division of Ser. No. 698,808, Aug. 16, 1996, abandoned. This application Sep. 9, 1997, Ser. No. 925,625

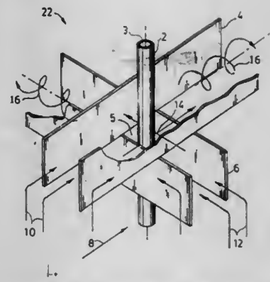
Int. Cl.[6] F28F *1/00;* **B01D** *45/12*

U.S. Cl. 165—119 **4 Claims**

1. A method for transferring heat from hot particulate laden gas to a fluid for the generation of electrical energy, heat or both, which comprises:

a) introducing particulate laden hot gas into a flue containing adjacent layers of vertically aligned strips, wherein the strips are spaced apart at equal intervals and alternate layers of strips are offset at an angle with respect to each other;

b) dividing the gas into a plurality of gas streams by the alternate layers of strips, wherein the strips force the gas Streams into two different directions;



c) intersecting the gas streams in one direction with the gas streams in the second direction to generate vortices, wherein the vortices force particles from the gas to precipitate; and

d) passing a coolant fluid in a heat transfer tube through the gas streams to remove heat from the gas.

5,813,452

COATING COMPOSITION FOR HYDROPHILIZATION AND METHOD FOR HYDROPHILIZATION

Yasuhiko Haruta; Katsumi Mitsuishi, both of Hiratsuka, and Ichiro Yoshihara, Fujisawa, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo-ken, Japan

Continuation of Ser. No. 412,866, Mar. 29, 1995, abandoned. This application Aug. 27, 1996, Ser. No. 703,895

Claims priority, application Japan, Apr. 1, 1994, 6-085300

Int. Cl.[6] C09D *133/06;129/04;163/00;167/00*

U.S. Cl. 165—133 **23 Claims**

1. A coating composition for hydrophilization comprising:

(A) a water-soluble or water-dispersible organic resin,

(B) organic resin fine particles having a weight-average particle diameter/number-average particle diameter ratio of 1.2 or less and an average primary particle diameter of 0.1–1 μm, which are obtained by polymerizing 100 parts by weight of a monomer mixture consisting of:

0.1–10% by weight of (a) at least one monomer selected from the group consisting of monomers represented by the following formulas (1) or (2)

$$H_2C{=}\overset{\overset{R^1}{|}}{C}-\underset{\underset{O}{\|}}{C}-O(CH_2CHO)_n-\overset{\overset{R^2}{|}}{}R^3 \qquad (1)$$

wherein R^1, R^2 and R^3 are independently a hydrogen atom or an alkyl group of 1–4 carbon atoms, and n is a number of 1–25,

$$H_2C{=}\overset{\overset{R^4}{|}}{C}-\underset{\underset{O}{\|}}{C}-NH-R^5 \qquad (2)$$

wherein R^4 is a hydrogen atom or an alkyl group of 1–4 carbon atoms, and R^5 is a hydrogen atom, an alkyl group of 1–4 carbon atoms, an alkoxy group of 1–4 carbon atoms, a hydroxyalkyl group of 1–4 carbon atoms, or a group of the following formula (3)

$$-R^6-NH-\underset{\underset{O}{\|}}{C}-\overset{\overset{R^7}{|}}{C}{=}CH_2 \qquad (3)$$

wherein R^6 is a bivalent organic group, and R^7 is a hydrogen atom or an alkyl group of 1–4 carbon atoms,

15–45% by weight of (b) divinylbenzene,

45–84.9% by weight of (c) styrene, and

0–39.9% by weight of (d) an unsaturated monomer other than the monomers (a), (b) and (c), copolymerizable with the

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monomers (a), (b) and (c) in the presence of 1–40 parts by weight of (e) at least one polymer selected from the group consisting of a polyacrylic acid and a polymethacrylic acid, in a solvent capable of dissolving said monomer mixture and said polymer (e) but substantially incapable of dissolving a copolymer formed by the polymerization of said monomer mixture, and

(C) a crosslinking agent,

the amount of (A) being 20–88 parts by weight, the amount of (B) being 10–50 parts by weight, and the amount of (C) being 2–30 parts by weight, per 100 parts by weight of the total of (A), (B) and (C).

5,813,453

HEAT EXCHANGER FOR COOLING CRACKED GAS

Peter Brucher, Oranienburg, Germany, assignor to Deutsche Babcock-Borsig AG, Berlin, Germany

Filed Apr. 3, 1997, Ser. No. 834,735

Claims priority, application Germany, Jun. 1, 1996, 196 22 139.0

Int. Cl.[6] F28F *9/02;9/04*

U.S. Cl. 165—134.1 **5 Claims**

1. A heat exchanger for cooling cracked gas, comprising: a plurality of cooling pipes; a plurality of outside pipes each having an inside diameter; each of said cooling pipes being accommodated in a said outer pipe and having two ends; a water chamber having a plurality of sections; each end of said cooling pipes being welded to a section of said water chamber; said water chamber supplying and receiving a coolant and having a straight and solid component with separated round depressions therein, each of said depressions accommodating a single cooling pipe and having a diameter at least as long as said inside diameter of said outer pipe; each of said depressions having an annular base with thinner residual walls adjacent said ends of said cooling pipe; said straight and solid component comprising said water chamber; said sections of said water chamber being individual sections fastened together, each of said sections having a single depression accommodating and surrounding a cooling pipe.

5,813,454

VARIABLY INSULATING PORTABLE HEATER/COOLER

Thomas F. Potter, Denver, Colo., assignor to Varitec Thermal, L.L.C., Denver, Colo.

Continuation-in-part of Ser. No. 194,932, Feb. 14, 1994, Pat. No. 5,562,154, which is a division of Ser. No. 960,885, Oct. 14, 1992, Pat. No. 5,318,108, which is a continuation-in-part of Ser. No. 856,840, Mar. 23, 1992, Pat. No. 5,175,975, Ser. No. 181,926, Apr. 15, 1988, abandoned, and Ser. No. 535,782, Jun. 12, 1990, Pat. No. 5,157,893. This application Sep. 10, 1996, Ser. No. 716,822

Int. Cl.[6] F28F *27/00*

U.S. Cl. 165—276 **1 Claim**

1. A portable variable conductance insulation heater/cooler device, comprising:

(a) a container having an air outlet and an insulated handle;

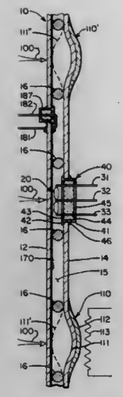
(b) a thermal storage medium within the container;

(c) a variable conductance insulation ("VCI") adjacent said thermal storage medium, said VCI including:

two hard sidewall sheets of metal positioned in closely spaced apart relation to each other and sealed around their edges by metal-to-metal welds to form a chamber therebetween, said chamber being evacuated to an extent sufficient to substantially eliminate gas molecule conduction of heat from one of said sidewall sheets to the other:

a plurality of glass-like spacers positioned in said chamber between said sidewall sheets and spaced apart in relation to each other, said glass-like spacers being shaped to make contact with said sidewall sheets; and

disabling means for selectively and reversibly disabling the capacity of said combination of sidewall sheets and evacu-



ated chamber to inhibit heat transfer, said disabling means including thermal short switch means for creating a metal-to-metal thermal short circuit between said two sidewalls;

(d) variable control means for variably controlling thermal access to the VCI, said means being responsive to: (i) a measured temperature at the air outlet, (ii) a user-configured desired temperature, and (ii) a measured temperature of the thermal storage medium;

(e) thermal charging means for charging the thermal storage medium; and

(f) directing means for directing an air flow from the container through the air outlet.

5,813,455

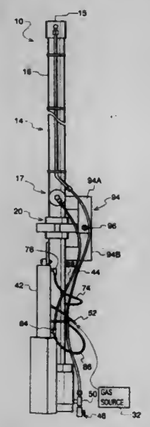
CHEMICAL DISPENSING SYSTEM

Gary V. Pratt, Woodward, and Ronald F. Sloan, Elk City, both of Okla., assignors to Amoco Coporation, Chicago, Ill.

Filed Mar. 11, 1997, Ser. No. 814,379

Int. Cl.[6] E21B *33/068;43/00*

U.S. Cl. 166—75.15 **23 Claims**



21. A method for dispensing chemical sticks into a well bore, the method comprising:

providing an elongate tubular receptacle having an upper storage section and a lower receiving chamber for being positioned above the well bore;

loading a plurality of chemical sticks into the receptacle stacked end-to-end therein with the at least one of the sticks in the receiving chamber and the remaining sticks in the storage section;

holding the sticks in the storage section;

opening the receiving chamber to be in communication with the well bore to dispense the at least one stick therein into the well bore;

closing the receiving chamber to be blocked from communication with the well bore after dispensing of the at least one stick; and

releasing the sticks in the storage section to allow the bottom stick therein to drop into the closed receiving chamber to load the receiving chamber with another stick for subsequently being dispensed into the well bore.

5,813,456

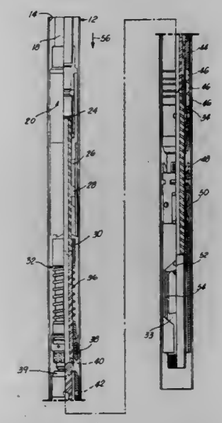
RETRIEVABLE BRIDGE PLUG AND RETRIEVING TOOL

John E. Milner, 6313 Wilshire Dr., Tyler, Tex. 75703, and David L. Farley, 415 Woodvale Ave., Lafayette, La. 70503

Filed Nov. 12, 1996, Ser. No. 746,468

Int. Cl.[6] E21B *33/128*

U.S. Cl. 166—135 **12 Claims**



1. A retrievable bridge plug apparatus for isolating a zone down a borehole, comprising:

a) a mandrel body portion;

b) a retrieving tool secured to an upper portion of the mandrel body;

c) expandable members on upper and lower ends of the mandrel body portion moveable to sealingly engage against the wall of a casing when sufficient weight is brought to bear on the mandrel body portion;

d) flow ports in the mandrel body for allowing fluid circulation through the apparatus for cleaning the expandable members prior to disengagement from the casing; and

e) means for disengaging the expandable members on the mandrel body from against the casing wall, so that the tool may be retrieved from the borehole.

5,813,457

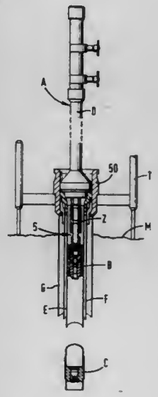
WELLBORE CEMENTING SYSTEM

Richard L. Giroux, Katy, Tex., and Peter Budde, Vlaardigen, Netherlands, assignors to Weatherford/Lamb, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 429,763, Apr. 26, 1995, Pat. No. 5,553,667. This application Aug. 29, 1996, Ser. No. 704,994

Int. Cl.[6] E21B *33/16*

U.S. Cl. 166—153 **12 Claims**



1. A plug set for wellbore operations comprising

a top plug, comprising a top plug body having a top and a bottom, the top plug body with a fluid flow bore therethrough from top to bottom and a closure sleeve within the fluid flow bore that initially prevents fluid flow through the fluid flow bore, the closure sleeve having a rupture area ruptureable in response to fluid at a minimum rupture pressure so that the introduction of fluid to the top plug at a pressure at least equal to said minimum pressure ruptures the area so that fluid is flowable through the top plug, and

a bottom plug releasably secured to the top plug.

5,813,458

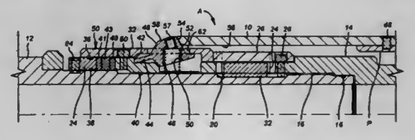
INDICATING DOG SUB FOR WEIGHT-SET PACKERS

Sidney K. Smith, Jr., Conroe, and George Givens, Houston, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 24, 1997, Ser. No. 789,369

Int. Cl.[6] E21B *33/128*

U.S. Cl. 166—182 **14 Claims**



1. A dog sub for use in a work string to set a packer, comprising:

a body;

at least one dog mounted to said body, selectively movable into contact with a portion of the packer for setting the packer with an applied force;

a signal mechanism in said body, movable to an indicating position responsively to an applied force exceeding a predetermined amount applied to said body.

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5,813,459

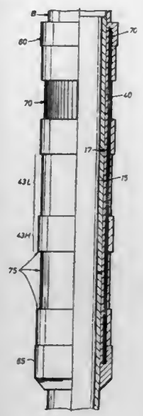
PROGRAMMED SHAPE INFLATABLE PACKER DEVICE

James V. Carisella, P.O. Box 10498, New Orleans, La. 70181

Continuation of Ser. No. 502,970, Jul. 17, 1995, Pat. No. 5,564,504, which is a continuation of Ser. No. 175,974, Dec. 30, 1993, Pat. No. 5,469,919. This application Sep. 11, 1996, Ser. No. 712,647

Int. Cl.[6] E21B *33/127*

U.S. Cl. 166—187 **2 Claims**



1. An inflatable packer device for use in a subterranean well bore having a wall and carryable into said well bore on a conduit, said inflatable packer device being inflatable by pressured fluid communicated to the packer from a source of pressured fluid, said inflatable packer device comprising:

(a) a body having means at its upper end for selective engagement to said conduit, said body further having an exterior surface;

(b) an inflatable elastomeric bladder concentrically disposed around said body, said bladder having an interior, the bladder further having a first bladder end and a second bladder end, the bladder further being selectively movable between deflated and inflated positions, the bladder further having a largest circumference and a smallest circumference;

(c) first securing means engageable with one of said bladder ends for sealably securing said bladder end to said body;

(d) second securing means being engageable with the other of said bladder ends for sealably securing said other bladder end to said body, at least one of said first and second securing means enabling at least one of said bladder ends to slidably move relative to said body during inflation of said bladder;

(e) fluid transmission means for communicating said pressured fluid between the source of pressured fluid and the interior of the bladder to move the bladder between each of deflated and inflated positions, whereby the inflatable packer device may be moved into one of sealing and unsealing relationship with said wall of said well bore;

(f) a re-enforcing sheath surrounding and secured relative to said bladder; and

(g) an elastomeric packing cover concentrically disposed around said sheath, said cover including a series of shape-controlling means along the length of said bladder and, after inflation, further providing a pressure-tight seal between the well wall and the conduit for causing substantially uniform, axial inflation of said bladder, whereby the shape-controlling means result in the ratio of the largest circumference of the bladder to the smallest circumference of the bladder during inflation being reduced and prevented from exceeding a predetermined maximum ratio, wherein said series of shape-controlling means comprise a plurality of inflation-resistant modules integrally disposed within and on said cover, such that each of said modules is an integral component of said cover, said modules including at least one high modulus modules formed from a relatively thick elastomer and having a first resistance to stretching and inflation forces, said modulus module including at least one low modulus formed from a relatively thinner elastomer than the at least one high modulus module and having a resistance to stretching and inflation forces less than those of the said at least one high modulus module, said module having a circumference larger than the circumference of said bladder in its uninflated position, but less than the circumference of the well bore, said high and low modulus modules being formed of separate sections of elastomer bonded together.

5,813,460

FORMATION EVALUATION TOOL AND METHOD FOR USE OF THE SAME

Paul D. Ringgenberg, Carrollton, Tex.; Roger Lynn Schultz, Stillwater, Okla.; Neal G. Skinner, Lewisville, Tex.; Margaret C. Waid, Houston, Tex.; Curtis E. Wendler, Carrollton, Tex., and Robert W. Srubar, Kathy, Tex., assignors to Halliburton Energy Services, Inc., Dallas, Tex.

Filed Jun. 3, 1996, Ser. No. 657,236

Int. Cl.[6] E21B *33/124;49/10*

U.S. Cl. 166—250.17 **35 Claims**

29. A method of operating a downhole tool comprising the steps of:

running the downhole tool into a wellbore, the downhole tool having a housing, a mandrel slidably disposed within said housing and a retractor sleeve operably associated with said housing and said mandrel;

increasing the fluid pressure inside the downhole tool;

axially sliding said mandrel relative to said housing in a first direction;

increasing the pressure inside the downhole tool;

axially sliding said retractor sleeve relative to said housing in said first direction;

rotatably sliding said retractor sleeve relative to said housing;

engaging said retractor sleeve with said mandrel;

decreasing the pressure inside the downhole tool;

axially sliding said retractor sleeve and said mandrel relative to the housing in a second direction;

decreasing the pressure inside the downhole tool; and

disengaging said retractor sleeve from said mandrel.

5,813,461

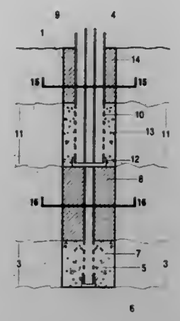
CO-AXIAL WELL CONSTRUCTION TECHNIQUE FOR HAZARDOUS WASTE ASSESSMENT AND REMEDIATION

Joseph P. Theisen, 1535 Oak St., Apt. #2, San Francisco, Calif. 94117

Filed Jul. 12, 1996, Ser. No. 679,229

Int. Cl.[6] E21B *49/08;33/047*

U.S. Cl. 166—264 **9 Claims**



6. A method of removing contaminants in a multiplicity of adjacent geologic strata comprising:

preparing a borehole with an inner wall and traversing an upper and at least part of a lower terrestrial stratum, each stratum with an upper and lower border;

positioning a first inner conduit with an outer surface, a first end distal to the terrestrial surface and a second end, a seal plugging the first end, and a plurality of perforations adjacent to the first end, said inner conduit positioned axial within the borehole such that the first end and adjacent perforations are located within the lower stratum;

adding a granular filtration material to the borehole external to the first conduit and adjacent to the perforations of the first conduit;

affixing a first barrier plug to the outer surface of the inner conduit distal from the first end and adjacent perforations, and proximate to the upper border of the lower stratum, said barrier plug extending axially from the inner conduit to the inner wall of the borehole and plugging the borehole thereby;

positioning a second conduit concentric with and surrounding the inner conduit, the second conduit having an outer surface a first end distal to the terrestrial surface and a second end, a seal continuous with and surrounding the inner conduit and plugging the first end of the second conduit, and a plurality of perforations adjacent to the first end, the second conduit projecting such that the first end and adjacent perforations are located within an adjacent stratum above the lower traversed stratum; adding a granular filtration material to the borehole external to the second conduit and adjacent to the perforations of the second conduit;

affixing a second barrier plug to the outer surface of the second conduit, distal to the first end and adjacent perforations, and proximate to the upper border of the upper stratum, said barrier plug extending axially from the second conduit to the inner wall of the borehole and plugging the borehole thereby;

attaching pumping devices to the second end of the first and second conduits; and,

pumping materials from the strata.

5,813,462

Patent Not Issued For This Number

5,813,463

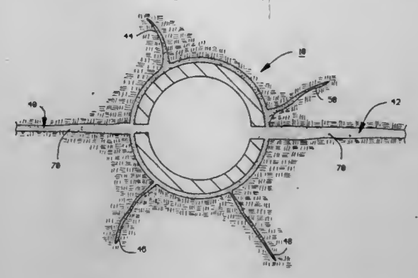
METHOD OF COMPLETING WELBORES TO CONTROL FRACTURING SCREENOUT CAUSED BY MULTIPLE NEAR-WELBORE FRACTURES

Jerome M. Stadulis, Arlington, Tex., assignor to Cross Timbers Oil Company, Fort Worth, Tex.

Continuation of Ser. No. 405,601, Mar. 17, 1995, Pat. No. 5,597,043. This application Jan. 28, 1997, Ser. No. 789,877

Int. Cl.[6] E21B *43/269*

U.S. Cl. 166—280 **6 Claims**



1. A method of completing a wellbore to allow production of hydrocarbons from a surrounding formation, comprising the method steps of:

forming a relatively small number of flow paths in a casing in said wellbore in a region of anticipated hydrocarbon production;

directing a plurality of relatively low-volume, high-concentration proppant slugs into said formation through said flow paths to screenout narrow fractures; and

directing fracturing fluids into said formation through said flow paths in order to enlarge a relatively small number of fractures.

5,813,464

Patent Not Issued For This Number

5,813,465

APPARATUS FOR COMPLETING A SUBTERRANEAN WELL AND ASSOCIATED METHODS OF USING SAME

Jamie B. Terrell, Fort Worth, and James M. Barker, Mansfield, both of Tex., assignors to Halliburton Energy Services, Inc., Dallas, Tex.

Filed Jul. 15, 1996, Ser. No. 680,198

Int. Cl.[6] E21B *29/02;29/06*

U.S. Cl. 166—298 **11 Claims**

1. A method of forming an opening through a tubular structure extending laterally across a wellbore to thereby provide access to the wellbore, the method comprising the steps of:

providing an apparatus having a cutting device including a cutting fluid source disposed therein and a series of spaced apart nozzles radially outwardly directed therefrom, the cutting fluid source being connected to the nozzles, so that a cutting fluid is flowable from the cutting fluid source through the nozzles;

positioning the apparatus within the tubular structure, said tubular structure having an inner wall, wherein the nozzles are directed toward the inner wall of the tubular structure proximate the location where the tubular structure laterally extends across the wellbore;

activating the cutting device; and

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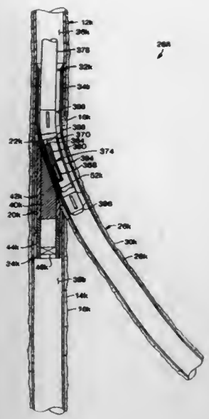


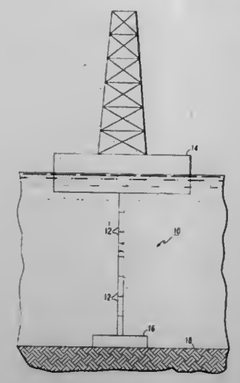
directing the cutting fluid to cut into the tubular structure proximate the location where the tubular structure laterally extends across the wellbore.

5,813,466
DELAYED ACID FOR GEL BREAKING
Ralph E. Harris, and Richard J. Hodgson, both of Horsham, United Kingdom, assignors to Cleansorb Limited, United Kingdom
PCT No. PCT/GB95/01295, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO95/33914, PCT Pub. Date Dec. 14, 1995
PCT Filed Jun. 6, 1995, Ser. No. 750,457
Claims priority, application United Kingdom, Jun. 6, 1994, 9411269
Int. Cl.[6] E21B *33/13;33/138;43/22;43/26*
U.S. Cl. 166—300 **12 Claims**

1. A method of breaking a crosslinked water-based gel, which method comprises:
(i) providing a said gel and, present therewith, an enzyme and a substrate which is capable of being converted by the enzyme into an organic acid which breaks down the gel, and
(ii) allowing the enzyme to catalyze the conversion of the substrate into the acid to cause thereby the breakdown of the gel.

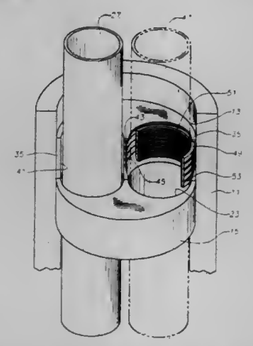
5,813,467
COMPOSITE CYLINDER TERMINATION FORMED USING SNAP RING
Jeffrey J. Anderson, Sunnyvale; Donald A. Nance, Mountain View, and Craig S. Mickelson, San Jose, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Feb. 14, 1997, Ser. No. 800,601
Int. Cl.[6] E21B *17/01;* **B29D** *22/00*
U.S. Cl. 166—367 **11 Claims**

1. A composite-to-end connection arrangement comprising:
(A) a hollow cylinder of composite material extending along a central longitudinal axis;
(B) an end connection assembly having first and second longitudinally arranged segments coaxial with said axis and in contact with the inner surface of said cylinder at an end thereof, each said segment having an inner surface of predetermined diameter;
(C) said end of said cylinder being formed about said longitudinally arranged segments to assume the contour thereof, said



contour having a predetermined shape so as to prevent withdrawal of said segments from said cylinder;
(D) a snap ring of rest diameter D and having first and second ends moveable relative to one another to allow it to be compressed to a diameter smaller than D, so as to enable it to be inserted into said end connection assembly and to thereafter assume a larger diameter;
(E) said snap ring being positioned between said first and second segments, in said larger diameter condition, separating said segments and forcing them into intimate contact with the inner contoured surface of said cylinder, to limit axial movement of said end connection assembly due to predetermined load conditions, or to close any gaps or separation between the composite cylinder and the segments that may arise due to thermal contraction.

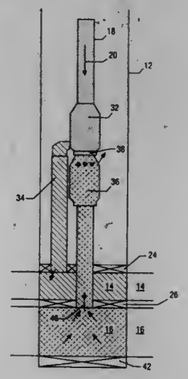
5,813,468
DUAL CASING HANGER
Eugene A. Borak, Jr., Cypress, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.
Filed Dec. 26, 1996, Ser. No. 780,118
Int. Cl.[6] E21B *33/047*
U.S. Cl. 166—368 **16 Claims**



1. An apparatus for hanging a first and second string of casing side-by-side in a single wellhead housing having a bore, comprising:
a lower casing hanger which lands in the bore on a shoulder, the lower casing hanger having a first hole and a second hole which are located adjacent to each other;
a first landing shoulder in the first hole;

a first slips located in the first hole on the first landing shoulder in the lower casing hanger for engaging the first string of casing to support the weight of the first string of casing;
an upper casing hanger having a first hole for receiving the first string of casing and a second hole, the upper casing hanger landing on top of the lower casing hanger;
a second landing shoulder in the second hole of the upper casing hanger; and
a second slips located in the second hole on the second landing shoulder in the upper casing hanger for engaging the second string of casing to support the weight of the second string of casing.

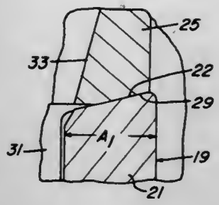
5,813,469
COUPLED DOWNHOLE PUMP FOR SIMULTANEOUS INJECTION AND PRODUCTION IN AN OIL WHEEL
Kevin R. Bowlin, Sugar Land, Tex., assignor to Texaco Inc., White Plains, N.Y.
Filed Mar. 12, 1997, Ser. No. 814,918
Int. Cl.[6] E21B *43/12*
U.S. Cl. 166—369 **17 Claims**



1. A coupled downhole pump comprising:
a driver pump;
a production pump;
coupling means for connecting the driver pump to the production pump; and
a tubing string, the tubing string containing a pressurized injection fluid and being in fluid communication with the driver pump so that at least a portion of the pressurized injection fluid is used by the driver pump to create a driving motion which is transferred to the production pump by the coupling means.

5,813,470
MEANS FOR RELIEVING LOAD ON STACKED CASING HANGERS
Amin Radi, Houston, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.
Filed Nov. 14, 1996, Ser. No. 751,013
Int. Cl.[6] E21B *43/10*
U.S. Cl. 166—382 **22 Claims**

1. In a well assembly having a wellhead housing with a bore for receiving a tubular member, an improved apparatus for supporting a plurality of the tubular members, comprising in combination:
an upward facing load shoulder within the bore which supports a casing hanger which has a bowl and a neck with an upper end that forms a load bearing upper shoulder, and an internal,



upward facing, lower shoulder which is formed in the bowl of the casing hanger; and
a tubular member with a downward facing, upper shoulder and a downward facing lower shoulder that is radially inward farther than the upper shoulder of the tubular member, with the lower shoulder of the tubular member landing on the lower shoulder of the casing hanger, and the upper shoulder of the tubular member landing on the upper shoulder of the casing hanger.

5,813,471
LAWN AERATOR WITH AN ARRAY OF AERATION POSTS
Philip M. Ramsey, 1014 White Oak Rd., Denver, Pa. 17517
Filed Sep. 25, 1997, Ser. No. 936,945
Int. Cl.[6] A01B *45/00*
U.S. Cl. 172—21 **4 Claims**

1. A ground aerator comprising, in combination:
a square base plate with a top surface, a bottom surface and a periphery formed therebetween, the top surface having a plurality of vertically oriented triangular supports coupled thereto and each extending between a center of the base plate and an associated one of the corners thereof and a tubular sleeve coupled to the top surface of the base plate at a center thereof, wherein the tubular sleeve is coupled to inboard edges of the triangular supports and further has a threaded interior surface;
an array of posts coupled to the bottom surface of the base plate and extending downwardly therefrom to define four rows and four columns, each post including an upper extent with a inverted frusto-conical configuration and a lower extent having an inverted conical configuration; and
an elongated cylindrical handle having a top end with an elastomeric grip formed thereon and a bottom end with a plurality of threaded grooves formed thereon for screwably coupling within the tubular sleeve such that the handle extends perpendicularly with respect to the base plate.

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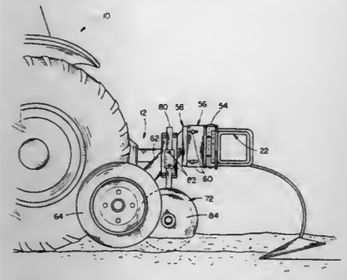
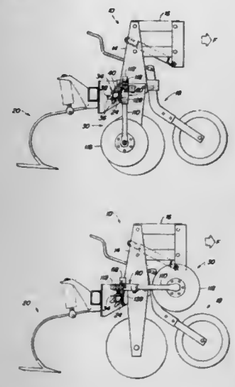
5,813,472
GUIDANCE SYSTEM FOR AN AGRICULTURAL IMPLEMENT
Richard A. Fixemer, 607 E. Hickory, Sutton, Nebr. 68979
Filed May 5, 1997, Ser. No. 851,198
Int. Cl.[6] A01B *63/00*
U.S. Cl. 172—26 **9 Claims**



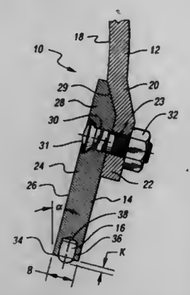
1. A guidance system for an implement drawn by a tractor with the implement being interconnected to the tractor by a hitch means, the implement including a tool bar having a rearward side, a forward side and opposite ends, comprising:
a first support means having rearward and forward ends;
said first support means being pivotally secured, at its said rearward end, about a vertical axis, to said tool bar inwardly of one end thereof and extending forwardly therefrom;
a ground engaging means rotatably mounted to said forward end of said first support means for following a ridge or a row;
and a ground engaging rotatable coulter means mounted on and supported by said support means rearwardly of said ground engaging means and forwardly of the pivotal connection of said first support means and said tool bar.

5,813,473
ADJUSTABLE FLIP-UP DISK MOUNTAIN ASSEMBLY
Philip David Cox, Polk City, Iowa, assignor to Deere & Company, Moline, Ill.
Filed May 8, 1997, Ser. No. 853,081
Int. Cl.[6] A01B *23/02*
U.S. Cl. 172—662 **20 Claims**



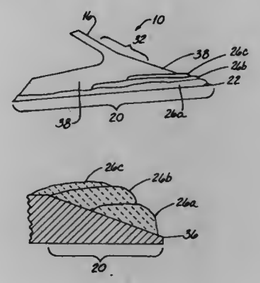
1. A mounting assembly for supporting a shank from a cross tube, the shank having a ground-working tool connected thereto for movement in soil in a forward direction, the mounting assembly comprising:
a connector adapted for mounting on the cross tube;
a bracket member including a pivot connected to the connector for pivoting of the bracket member relative to the cross tube about a pivot axis transverse to the forward direction in a first angular direction towards a working position and an opposite angular direction towards a storage position, the bracket member also including a shank-receiving portion supporting the shank relative to the cross tube;
a stop offset vertically from the pivot, the stop bottoming adjacent the cross tube and preventing pivoting of the bracket member beyond the working position as the bracket member is pivoted from the storage position to the working position; and
wherein movement of the tool in the forward direction through the soil urges the shank and bracket member in the first angular direction with the stop bottoming relative to the cross tube so that shank loads adjacent the stop are transferred to the cross tube through the stop.

5,813,474
PLOW BLADE
Terry A. Manway, Monroeville, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Continuation of Ser. No. 653,167, May 24, 1996, abandoned. This application Sep. 11, 1997, Ser. No. 937,226
Int. Cl.[6] E02F *3/815*
U.S. Cl. 172—701.3 **20 Claims**



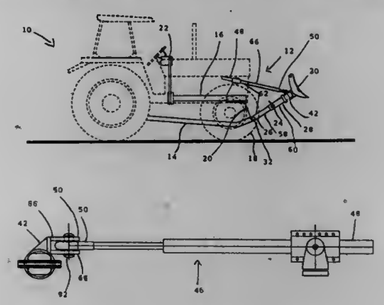
1. A snowplow blade for removing snow from a surface, the snowplow blade comprising:
an elongated support member having a support member length;
a blade edge detachably mounted to the support member and said blade edge having a blade edge body with a blade edge length, a blade edge height and a blade edge thickness, wherein the blade edge length is greater than the blade edge height and the blade edge thickness; wherein the blade edge length extends in the direction of the support member length; said blade edge having a lower edge defined by said blade edge length and said blade edge thickness; and said lower blade edge having first and second insert holes therein distributed along the blade edge length;
first and second blade inserts, each having a wear portion, the wear portion having a convex curved wear surface, the first and second blade inserts being brazed into the first and second insert holes along the lower edge such that the wear portion will contact the surface from which the snow is to be removed;
wherein each of the first and second blade inserts are spaced apart so as to be in a non-contacting relationship with each other.

5,813,475
HARDFACED AGRICULTURAL SWEEP AND METHOD FOR APPLYING HARDFACING
Timothy J. Bergan, Plainfield; Jimmy R. Kreftmeyer, Minooka; Edward Norman A. Rahe, Downers Grove; James L. Sherman, Naperville; Christopher J. Shutts, Schaumburg, and John T. Sponzilli, Warrenville, all of Ill., assignors to Case Corporation, Racine, Wis.
Filed Jun. 18, 1997, Ser. No. 878,013
Int. Cl.[6] A01B *39/20*
U.S. Cl. 172—719 **15 Claims**



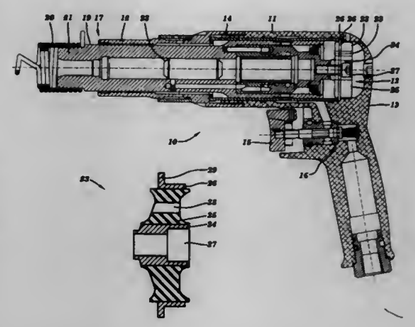
1. In an agricultural sweep having a main body with a tip having a forward extremity, and winged portions extending away from the tip, and wherein each winged portion has a cutting edge and the tip and winged portions have hardfacing material thereon, the improvement wherein:
the hardfacing material on the tip is applied by welding, terminates above the forward extremity and has a width;
the hardfacing material on the winged portions is applied by welding, is above the cutting edges and has a width;
the width of the hardfacing material on the tip is greater than the width of the hardfacing material on the winged portions; and
the hardfacing material on the tip and on the winged portions is applied in a continuum, thereby conforming the location of hardfacing material to a soil pressure gradient.

5,813,476
BLADE MOUNTING STRUCTURE
Luis O. Semper, Apdo, 99 La Uruca, (1150) San Jose, Costa Rica
Filed Nov. 6, 1996, Ser. No. 744,304
Int. Cl.[6] E02F *3/76*
U.S. Cl. 172—822 **19 Claims**



1. A bulldozer blade mounting structure, comprising:
a first pivot arm having a first end adapted for pivotal attachment to a tractor and a second end coupled to a bulldozer blade;
a second pivot arm having a first end adapted for pivotal attachment to a tractor and a second end coupled to a bulldozer blade;
a first coupling joint coupling the second end of the first pivot arm to the bulldozer blade, the first coupling joint permitting the bulldozer blade to rotate about a longitudinal axis of the first pivot arm and to rotate about an axis substantially perpendicular to the longitudinal axis of the first pivot arm;
a second coupling joint coupling the second end of the second pivot arm to the bulldozer blade, the second coupling joint permitting the bulldozer blade to rotate about a longitudinal axis of the second pivot arm and to rotate about an axis substantially perpendicular to the longitudinal axis of the second pivot arm;
a first actuator having a first end adapted for attachment to a tractor and a second end pivotally secured to the first coupling joint;
a second actuator having a first end adapted for attachment to a tractor a second end pivotally secured to the second coupling joint;
wherein movement of the first actuator and the second actuator is used to cause predetermined movement of the bulldozer blade.

5,813,477
VIBRATION-REDUCED IMPACT TOOL AND VIBRATION ISOLATOR THEREFOR
John D. Clay, New Hartford; Paul Bilodeau, Frankfort, both of N.Y., and Robert J. Michael, Erie, Pa., assignors to Chicago Pneumatic Tool Company, Utica, N.Y., and The Lord Corporation, Erie, Pa.
Filed May 23, 1996, Ser. No. 653,728
Int. Cl.[6] B25D *9/04*
U.S. Cl. 173—1 **13 Claims**



1. A vibration-reduced impact tool comprising:
a cylinder assembly operatively assembled within said tool;
a piston operatively positioned within said cylinder assembly, wherein said piston is reciprocally movable between a forward and rearward position;
means, operatively connected to said piston, for driving said piston; and
an elastomeric isolator operatively coupled to the cylinder assembly and affixed within said tool, said elastomeric isolator including:
an inner member;
an elastomeric member surrounding a circumferential periphery of said inner member; and
an apertureless outer flanged member extending radially outward from said elastomeric member.

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5,813,478

PULSE TOOL

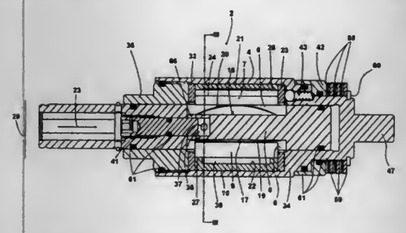
Konrad Kettner, Aalen, Germany, assignor to Deutsche Gardner-Denver GmbH & Co., Westhausen, Germany

Filed Jul. 30, 1996, Ser. No. 689,129

Claims priority, application European Pat. Off., Aug. 17, 1995, 95112983

Int. Cl.[6] B25B *19/00*

U.S. Cl. 173—93 **23 Claims**



1. A pulse tool, comprising a pulse unit which includes a hydraulic cylinder including an inner wall, said cylinder being driven by a motor and a driven shaft supported in said cylinder, with two seal rollers each being displaceably supported in corresponding radial grooves of said driven shaft and power-operated outwardly toward said inner wall of said cylinder, said seal rollers being simultaneously in contact only in a single rotary position of said cylinder with corresponding seal strips that project relative to said inner wall of said cylinder so as to produce an angular momentum, one of said radial grooves comprising lift delaying means for restricting centrifugal movement of one of said seal rollers corresponding to said one of said radial grooves, said lift delaying means for causing said one of said seal rollers to serve as a compensating roller.

5,813,479

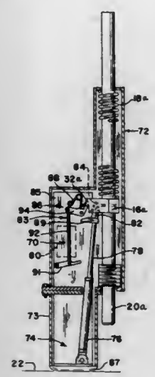
TRIGGER MECHANISM FOR IMPACTING DEVICE

Marinus A. Bosma, 2234 Marina Park Dr., Fort Myers, Fla. 33905

Continuation-in-part of Ser. No. 540,223, Oct. 6, 1995, Pat. No. 5,662,177. This application Apr. 7, 1997, Ser. No. 838,453

Int. Cl.[6] B25D *17/24*

U.S. Cl. 173—202 **12 Claims**



8. A device for demolishing the surface of a frangible material with a sudden, concentrated high impact force, said device including:

a casing elongated in a direction extending generally perpendicular to the surface to be demolished;

an elongated power plunger in said casing, said plunger being reciprocable in said casing and having a working end extending outwardly through an opening in said casing;

an actuating means for physically moving said power plunger inwardly away from said opening toward a cocked position;

means for guiding reciprocable lengthwise movement of said power plunger;

a latch member within said casing and affixed to said power plunger between the ends thereof;

power means associated with said power plunger, said power means being loadable against an impacting movement direction for enabling said plunger to be driven toward the material upon release of said latch member;

a fixed-position trigger mechanism for latching said latch member in said cocked position;

means for positioning the casing to predetermine the length of stroke between the working end of said power plunger and the material surface;

means for controlling said actuating means to move said plunger from a first position where its working end is in contact with said surface to a second position corresponding to said cocked position, said latch member being automatically latched by said trigger mechanism upon reaching said cocked position;

said actuating means being operable after the latch member has been latched to return said actuating means to its first position; and

means for operating said trigger mechanism to release said latch member upon return of said actuating means to its first position.

5,813,480

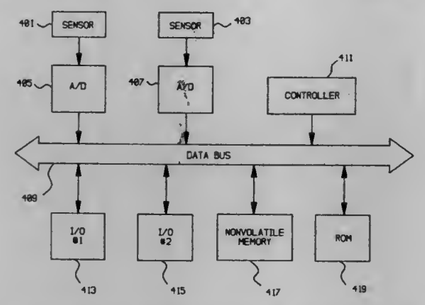
METHOD AND APPARATUS FOR MONITORING AND RECORDING OF OPERATING CONDITIONS OF A DOWNHOLE DRILL BIT DURING DRILLING OPERATIONS

Theodore Edward Zaleski, Jr., Houston, and Scott Ray Schmidt, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 643,909, May 7, 1996, which is a continuation of Ser. No. 390,322, Feb. 16, 1995, abandoned. This application Dec. 3, 1996, Ser. No. 760,122

Int. Cl.[6] E21B *10/00;47/12;12/02*

U.S. Cl. 175—40 **88 Claims**



1. An improved downhole drill bit for use in drilling operations in wellbores, comprising:

an integrally formed bit body;

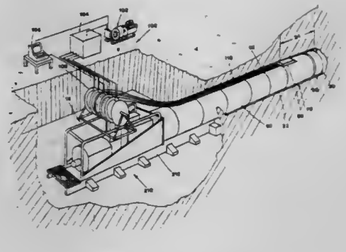
at least one cutting structure carried on said integrally formed bit body;

a coupling member located at an upper portion of said intergrally formed bit body for securing said bit body to a drillstring;

at least one operating condition sensor located in and carried by said integrally formed bit body for monitoring at least one bit operating condition during drilling operations;

at least one semiconductor memory device, located in and carried by said integrally formed bit body, for recording in memory data pertaining to a likely failure condition for a time interval which is substantially co-extensive with said drilling operations; and

an electrical power supply located in and carried by said integrally formed bit body for supplying electrical power to electrical power consuming components carried by said integrally formed bit body.



5,813,481

SYSTEM FOR IN SITU REPLACEMENT OF CUTTING MEANS FOR A GROUND DRILL

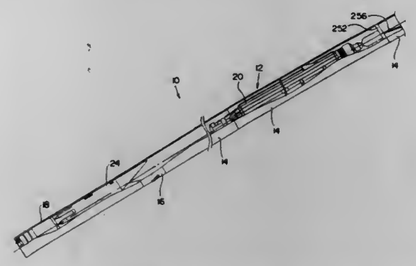
Gavin Thomas McLeod, Bullcreek, and Matthew Vance Egan, Leeming, both of Australia, assignors to Down Hole Technologies, Ltd., Myaree, Australia

Division of Ser. No. 433,402, Jul. 7, 1995, Pat. No. 5,662,182. This application Jun. 7, 1995, Ser. No. 473,879

Claims priority, application Australia, Jun. 16, 1993, PL 9407; Mar. 2, 1994, PM 4158; Mar. 2, 1994, PM 4159

Int. Cl.[6] E21B *10/64*

U.S. Cl. 175—52 **11 Claims**



1. An insert for releasably retaining cutting means in a ground drill, said insert comprising a substantially cylindrical member movable within said ground drill between an installation position in which said insert retains said cutting means in a cutting position between an outer circumferential surface of said insert and an inner circumferential surface of said ground drill, and a retrieval position in which said insert is retracted to release said cutting means from between said outer circumferential surface of said insert and said inner circumferential surface of said ground drill.

5,813,482

EARTH BORING SYSTEM AND APPARATUS

Leo J. Barbera, 1835 Youngs Rd., Southern Pines, N.C. 28387

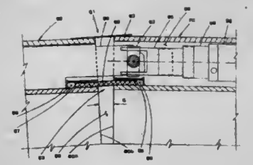
Filed Dec. 26, 1995, Ser. No. 578,740

Int. Cl.[6] E21B *7/06;7/20;* **E21D** *9/08*

U.S. Cl. 175—61 **34 Claims**

1. An earth boring system for cutting an earthen bore and installing a string of underground pipe casings joined together to form a cased bore hole in earth by pushing and guiding said string of pipe casings through said earthen bore, said system including:

a mechanical power unit for forcing said pipe casings through said earthen bore;



a front casing disposed directly in front of a lead pipe casing of said string of pipe casings, said front casing including at least an outer front casing wall;

a steering head directly in front of said front casing for guiding said string of pipe casings, said steering head including at least an outer steering head wall;

a cutter head carried forward of said steering head for cutting said earthen bore;

an axially aligned earth removal channel defined through an interior portion of said front casing and said steering head;

a conveyor associated with said cutter head for removing excess earth through said earth removal channel; said conveyor driven within said string of pipe casings by said power unit;

an interface gap defined by opposing end faces of said outer steering head wall and said outer front casing wall to provide for displacements of said steering head relative to said front casing within said earthen bore for guiding said string of pipe casings;

a plurality of hinge assemblies connecting said steering head and said front casing at a plurality of locations adjacent said interface gap for providing relative movements between said steering head and said front casing;

a first connector part of each hinge assembly associated with said front casing;

a second connector part of said each hinge assembly associated with said steering head; and

a hinge formed between said first and second connector parts for providing rotations of said steering head relative to said front casing;

a protective enclosure associated with said plurality of hinge assemblies for protecting said hinge assemblies from loose earthen material cut from said earthen bore and from said excess earth moving within said earth removal channel, and said protective enclosure having an enclosure which generally prevents earthen and foreign material originating within the interior of said steering head and front casing from contacting said hinges assemblies as said steering head articulates relative to said front casing;

enclosure elements of said protective enclosure covering said interface gap to exclude said loose earthen material and said excess earth from entry into said protective enclosure; and

said enclosure elements including a retainer ring assembly for closing said interface gap adjacent said earth removal channel, and a closure ring for closing said controlled interface

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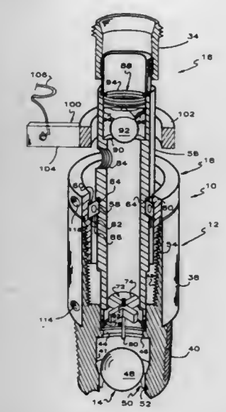
gap at an outer pipe adjacent said earthen bore, such that said protective enclosure completely encloses at least said first and second connector parts of said hinge assembly.

5,813,483

SAFETY DEVICE FOR USE ON DRILLING RIGS AND PROCESS OF RUNNING LARGE DIAMETER PIPE INTO A WELL

James A. Latham, 523 E. Ave. B, Robstown, Tex. 78380, and Taylor W. Latham, 10612 Emmord Loop, Corpus Christi, Tex. 78410

Filed Dec. 16, 1996, Ser. No. 767,508
Int. Cl.[6] E21B *21/10;34/10;* **F16K** *15/04*
U.S. Cl. 175—218 **28 Claims**



1. A process of running large diameter pipe into a well using a drilling rig having a mud system and a derrick, the large diameter pipe being on the bottom of smaller diameter pipe having an axial flow path therethrough, comprising

attaching a safety sub to an upper threaded connection of a joint of the smaller diameter pipe upright in the derrick, the safety sub including a flexible hose connected to the mud system of the rig, a valve section attached to the upper threaded connection of the smaller diameter pipe and having a valve element movable to preventing upward flow in the smaller diameter pipe, and an operator section removably attached to the valve section normally holding the valve element in a position allowing upward flow in the small diameter pipe, then

running the joint of the smaller diameter pipe into the well, then

in response to a low pressure mud flow upwardly in the smaller diameter pipe, diverting the low pressure mud flow through the safety sub and flexible hose into the mud system, and

in response to a high pressure mud flow upwardly in the smaller diameter pipe, manipulating the safety sub and closing the axial flow path against upward flow therethrough whereby a kick may be controlled,

after the axial flow path is closed, removing the operator section and exposing a connection to the valve section, then

attaching a source of pressure to the valve section connection, and then

opening the axial flow path for downward fluid flow into the smaller diameter pipe and pumping high pressure weighted liquid through the valve section, through the smaller diameter pipe and through the large diameter pipe into the well,

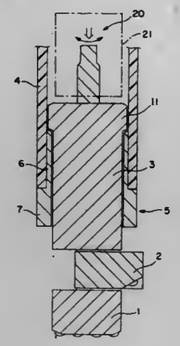
clearing the axial flow path by pumping the valve element downwardly out of the safety sub into the smaller diameter pipe.

5,813,484

CASING TUBE WITH CASING SHOE

Ross Christian Ekström, Sunne, Sweden, assignor to Atlas Copco Craelius AB, Marsta, Sweden

PCT No. PCT/SE95/00434, § 371 Date Mar. 31, 1997, § 102(e) Date Mar. 31, 1997, PCT Pub. No. WO95/29321, PCT Pub. Date Nov. 2, 1995
PCT Filed Apr. 21, 1995, Ser. No. 732,309
Claims priority, application Sweden, Apr. 21, 1994, 9401349
Int. Cl.[6] E21B *17/10*
U.S. Cl. 175—325.2 **5 Claims**



1. A casing tube having a casing shoe for drilling layers of earth or rock by means of impact drilling, said casing shoe (5) being formed from metal, and said casing tube (4) being formed from plastic and fastened to said casing shoe, said casing shoe having a first portion (7) thereof having an outer diameter substantially the same as that of said casing tube, said casing shoe having a second portion (6) thereof to which said casing tube is fastened, said second portion of said casing shoe having a diameter less than said diameter of said first portion of said casing shoe, wherein said second portion of said casing shoe defines threads for locking said casing shoe (5) to said casing tube (4); said casing shoe being provided with a tubeformed extension (32) which extends into the casing tube (4) for protecting said casing tube along a region at which said casing tube is fastened to said casing shoe.

5,813,485

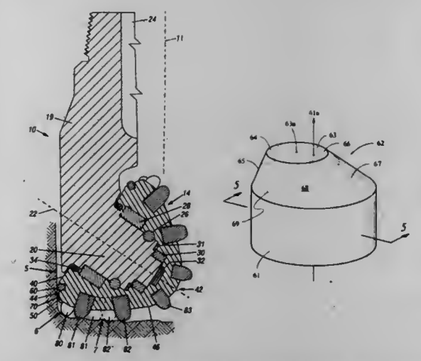
CUTTER ELEMENT ADAPTED TO WITHSTAND TENSILE STRESS

Gary R. Portwood, Kingwood, Tex., assignor to Smith International, Inc., Houston, Tex.

Filed Jun. 21, 1996, Ser. No. 668,109
Int. Cl.[6] E21B *10/08*
U.S. Cl. 175—430 **69 Claims**

1. A shaped cutter element for use in a rolling cone drill bit, comprising:

a cutting surface, said cutting surface including a leading face, a trailing face, and a wear face having leading and trailing sections, said leading face and said leading section defining a leading transition therebetween and said trailing face and said trailing section defining a trailing transition therebetween:



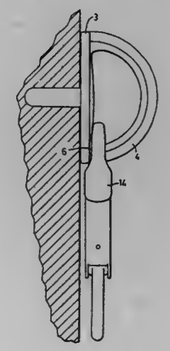
wherein said leading transition is sharper than said trailing transition.

5,813,486

D-RING ANCHORAGE CONNECTOR

Keith A. Smith, Burlington; Steve B. Levay, Font Hill, and Bob Claus, Welland, all of Canada, assignors to Haun Drop Forge Co., Ltd., Ontario, Canada

Filed Sep. 16, 1996, Ser. No. 714,579
Int. Cl.[6] A47L *3/04*
U.S. Cl. 182—3 **9 Claims**



1. An anchorage connector comprising:

(i) attachment means to secure said connector to a surface of an object;

(ii) a base plate connected to said attachment means, said base plate providing a means to distribute forces to which said connector is subjected across the surface of the object when said connector is secured to the object by said attachment means; and,

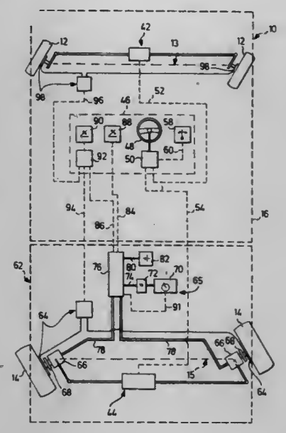
(iii) a generally arched shaped anchoring ring having its upper end attached to the upper portion of said base plate and its lower end attached to the lower portion of said base plate such that said anchoring ring is positioned approximately perpendicular to said base plate, the width of said anchoring ring when viewed in a plane parallel to said base plate being greater at its upper and lower ends than at its apex such that said width of said ring is tapered towards said apex, each side of said anchoring ring having a chamfer on its inner edge, said chamfer being wider at said upper and lower ends of said anchoring ring than at said apex, said tapered width of said anchoring ring and said chamfer assisting in the encouragement and direction of a hook latched around said anchoring ring towards said apex when said anchoring ring is horizontally oriented, or towards said lower end of said anchoring ring when said anchoring ring is vertically oriented.

5,813,487

OMNIBUS

Robert Lee, Leinfelden-Oberaichen, and Karl-Heinz David, Stuttgart, both of Germany, assignors to Gottlob Auwärter GmbH & Co., Germany

Filed Feb. 28, 1997, Ser. No. 807,252
Claims priority, application Germany, Sep. 2, 1994, 44 31 305.5
Int. Cl.[6] B60K *1/00*
U.S. Cl. 180—65.1 **33 Claims**



1. An omnibus comprising:

steered front wheels as well as steered and driven rear wheels, said rear wheels being arranged in a rear end region of the omnibus such that wheel housings associated with the rear wheels are arranged essentially at the rear end of the omnibus; and

an electric drive comprising at least one electric wheel hub motor free of slip for driving the rear wheels;

wherein a steering movement of the rear wheels is coupled to a steering movement of the front wheels such that a predeterminable, virtual wheelbase R_v is generated which is shorter than an actual wheelbase R_r.

5,813,488

ELECTRIC WHEEL DRIVE FOR A UTILITY VEHICLE

Heinz Weiss, Bensheim, Germany, assignor to Deere & Company, Moline, Ill.

Filed Jun. 5, 1997, Ser. No. 869,875
Claims priority, application Germany, Jun. 14, 1996, 196 23 737.8
Int. Cl.[6] B60K *1/02*
U.S. Cl. 180—65.6 **6 Claims**

1. A single wheel drive for agricultural or industrial utility vehicles, each wheel being driven by a respective drive having an electric motor, with an output shaft which drives a final drive gearbox that reduces the rotational speed of the driven wheel, wherein each drive comprises:

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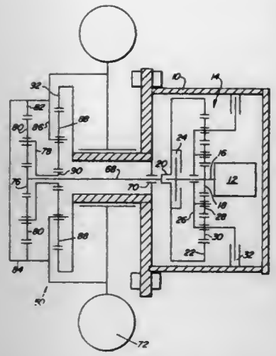
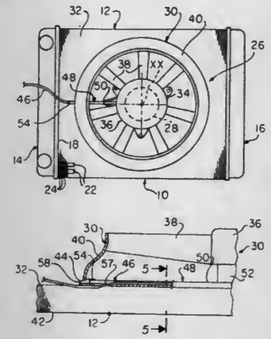


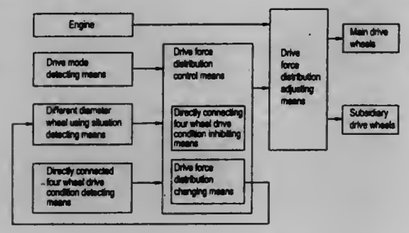
a transmission gearset coupled between the electric motor and the final drive gearbox, the transmission gearset being capable of being shifted between at least two rotational speed transmission ratios.

5,813,489
ELECTRICAL CONNECTING DEVICE FOR A MOTORIZED FAN UNIT MOUNTED ON A FINNED BODY OF A HEAT EXCHANGER
Michel Potier, Rambouillet, and Eduardo Santander, Vitry-sur-Seine, both of France, assignors to Valeo Thermique Moteur, France
Filed Jan. 29, 1996, Ser. No. 592,990
Claims priority, application France, Jan. 30, 1995, 95 01044
Int. Cl.[6] B60K *11/00*
U.S. Cl. 180—68.1 **9 Claims**



1. An assembly comprising, in combination, a heat exchanger having a body including cooling fins, and a motorized fan unit mounted on said body and having an electric motor and a fan rotor coupled to the electric motor so as to be driven thereby, with means securing the electric motor on said body of the heat exchanger, the heat exchanger body defining a major face thereof and the fan rotor being disposed in facing relationship with said major face, wherein the assembly further includes electrical connecting means having a bundle of electrical cables extending from said motor and alone at least part of said major face of the body of the heat exchanger, together with fastening means holding said bundle flat against the body of the heat exchanger and away from any contact with the fan rotor, wherein said fastening means include a channel member defining a U-shaped profile receiving said bundle therein, and having an inner end connected to the motor and an outer end, with said outer end extending beyond the perimeter of the fan rotor and therefore beyond the working zone of the latter.

5,813,490
FOUR WHEEL DRIVE SYSTEM FOR AUTOMOTIVE VEHICLE
Toshiharu Takasaki, Sagamihara, and Tomoyuki Hara, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 21, 1995, Ser. No. 531,441
Claims priority, application Japan, Sep. 21, 1994, 6-226468; Sep. 21, 1994, 6-226472
Int. Cl.[6] B60K *17/35*
U.S. Cl. 180—250 **5 Claims**



1. A four wheel drive system for an automotive vehicle, the system comprising a drive force distribution adjusting means which uses either front wheels or rear wheels of the vehicle as main drive wheels while using remaining wheels as subsidiary drive wheels and which distributes a drive force supplied from an engine of the vehicle between the main and subsidiary drive wheels in accordance with a control signal, and a drive force distribution control means which determines a drive force distribution for the main and subsidiary drive wheels and which sends the control signal to the drive force distribution adjusting means in accordance with the determined drive force distribution, the system further comprising a vehicle speed detecting means for detecting a current vehicle speed, wherein:

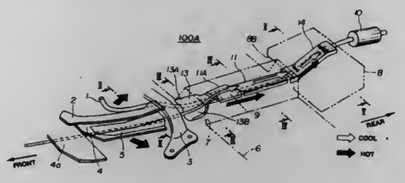
the drive force distribution control means includes a directly connecting four wheel drive condition inhibiting means which inhibits a drive condition from being a directly connecting four wheel drive condition in which the drive force distribution for the main and subsidiary drive wheels is 1:1, based on a difference of rotating speed between the main and subsidiary drive wheels,

wherein, when the difference is greater than a predetermined value, the four wheel drive condition inhibiting means inhibits the four wheel drive condition, and

wherein the predetermined value is a variable that changes based on the current vehicle speed as detected by the vehicle speed detecting means.

5,813,491
UNDER BODY STRUCTURE OF MOTOR VEHICLE
Manabu Sato, Zushi; Yuji Sinpo, Hiratsuka; Masatoshi Aoki, Noshiro, and Kenshi Funase, Hayato, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan
Filed Mar. 6, 1996, Ser. No. 612,617
Claims priority, application Japan, Mar. 7, 1995, 7-046009
Int. Cl.[6] B60K *13/04*
U.S. Cl. 180—309 **26 Claims**

22. In a motor vehicle having an engine mounted in an engine room, an exhaust tube extending between said engine room and a rear portion of the vehicle and a fuel tank positioned at the rear portion;



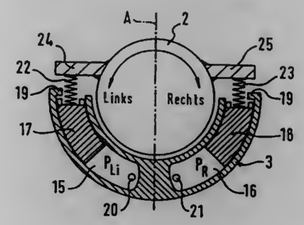
an under body structure comprising:

an under cover positioned below said engine room, having a longitudinal, upward swelling portion defining a first groove with a downward facing opening for receiving cooling air;

a floor panel having a longitudinally extending tunnel whose opening faces downward, said tunnel housing therein said exhaust tube spaced from said tunnel; and

a first heat insulating plate disposed in and extending substantially over the entire length of said tunnel in a manner to define, in cooperation with said tunnel, a first air flow passage for guiding the cooling air, said first flow passage having a front end and a rear end, wherein said first groove of the under cover is in fluid communication with said front end and said rear end opens toward the fuel tank to direct the cooling air toward the fuel tank.

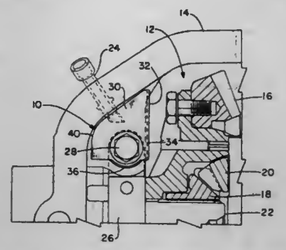
5,813,492
HYDRAULIC FEEDBACK CONTROL
Bernd Langkamp, Stuttgart, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany
Filed May 16, 1996, Ser. No. 648,855
Claims priority, application Germany, May 16, 1995, 195 17 871.8
Int. Cl.[6] B62D *5/06*
U.S. Cl. 180—417 **15 Claims**



1. A hydraulic feedback control for a hydraulic power steering system having first and second shaft sections that are rotatable relative to one another within limits and whose relative rotation actuates a servo valve system to control a pressure differential between connections of a servo motor or between feedback connections in order to change a resistance that opposes said relative rotation between the shaft sections, said feedback control having at least one compressor working chamber tangential to an axis of rotation of said shaft sections,

wherein the compressor working chamber is configured as a piston working chamber and a piston is arranged in the piston working chamber, said piston being displaceable therein and separate from the first shaft section, said piston being tensioned by a pressure in the piston working chamber against a spring engaged with each of the first shaft section and the piston, with a maximum possible displacement travel of the piston relative to the second shaft section being limited by a stop mounted thereon.

5,813,493
LUBRICATION FLUID DEFLECTOR/BAFFLE FOR A MOTOR VEHICLE AXLE ASSEMBLY
David Paul Sloan, Columbia City, Ind., and Paul G. Moreau, Jr., Commerce Township, Mich., assignors to Dana Corporation, Toldo, Ohio
Filed Apr. 15, 1997, Ser. No. 839,615
Int. Cl.[6] F01M *1/10*
U.S. Cl. 184—6.12 **20 Claims**

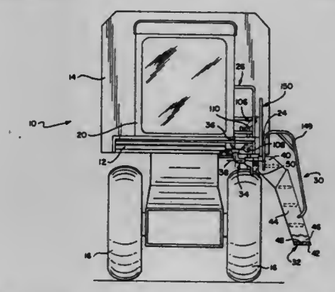


1. A lubrication fluid deflector/baffle adapted for installation in a motor vehicle axle assembly including a motor vehicle differential housing having an opening or vent, a bearing assembly secured in position by a bearing cap and a threaded fastener and lubricating fluid therein, said lubrication fluid deflector/baffle comprising:

a front mounting portion having an opening therein, said front mounting portion capable of being secured on said bearing cap by said threaded fastener; and

a side lubrication fluid deflector/baffle portion which precludes lubrication fluid from entering into the vicinity of motor vehicle differential housing adjacent the opening or vent to reduce or eliminate lubrication fluid from "leaking" through said opening or vent.

5,813,494
ACCESS LADDER ASSEMBLY FOR AN OFF-HIGHWAY MACHINE
Timothy G. Ulschmid, Racine; Richard A. Hardesty, Franksville, both of Wis., and Herb Max Farley, Colona, Ill., assignors to Case Corporation, Racine, Wis.
Filed Feb. 16, 1995, Ser. No. 389,328
Int. Cl.[6] E06C *5/04*
U.S. Cl. 182—97 **21 Claims**



15. An access ladder assembly for an off-highway machine having a frame with an elevated operator station, said ladder assembly comprising:

a ladder providing access to the operator station, said ladder being connected to the frame by a singular pivot mechanism having a generally horizontal axis intersecting a generally vertical axis that allows pivotal movement of the ladder about both the generally horizontal axis and the generally vertical axis.

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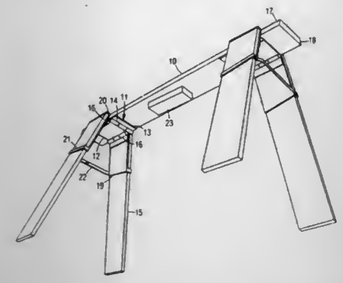
5,813,495
COLLAPSIBLE SAWHORSE WITH HINGED LEGS
Kevin Smith, 419 Shepp Ct., Santa Rosa, Calif. 95407
Filed May 13, 1997, Ser. No. 855,493
Int. Cl.[6] E04G *1/34*
U.S. Cl. 182—155 **1 Claim**



1. A collapsible sawhorse, comprising:

a elongated horizontal board with opposite longitudinal beveled side edges continuously extending between opposite ends, said beveled side edges are tapered in an upwardly direction; and

a plurality of backing plates each having an inner side hinged to said board by a longitudinal hinge and a transverse hinge, said longitudinal hinge having a longitudinal rotational axis extending between said opposite ends of said board, said transverse hinge having a transverse rotational axis extending between said side edges of said board, said backing plates each including a strap with opposite ends fastened to opposite side edges thereof at a lower end and a L-shaped bracket at a top end; and

a plurality of legs each positioned through said strap of a corresponding backing plate and having an upper end abutting a corresponding L-shaped bracket, each of said legs having an extended position generally orthogonal to said board, and is foldable about said longitudinal axis and said transverse axis to a collapsed position generally parallel to said board, said inner side of each of said backing plates engaging flat against a corresponding one of said beveled side edges of said horizontal board when said legs are in said extended position, so that said legs are outwardly spread.

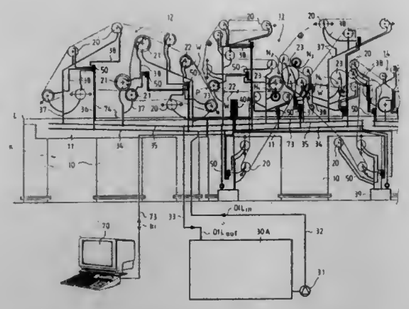
5,813,496
SYSTEM FOR MONITORING AND CONTROL OF THE CIRCULATION LUBRICATION OF THE BEARINGS OF CYLINDERS AND ROLLS IN A PAPER MACHINE
Hannu Hyvönen, Vesanka; Pauli Pakarinen, Jyväskylä; Jukka Koiranen, Jyväskylä, and Harri Vähätalo, Jyväskylä, all of Finland, assignors to Valmet Corporation, Helsinki, Finland
Filed Feb. 27, 1996, Ser. No. 607,853
Claims priority, application Finland, Feb. 27, 1995, 950877
Int. Cl.[6] F16N *7/40*
U.S. Cl. 184—6.4 **19 Claims**

1. A system for control and monitoring of circulation lubrication of bearings of revolving cylinders and rolls in a paper machine situated in a paper machine hall and arranged at a floor level of the paper machine hall, comprising:

at least one oil-lubrication storage means,

actuator panels arranged above the floor level of the paper machine hall,

first pipe means for feeding lubrication oil from said at least one oil-lubrication storage means to each of said actuator panels,

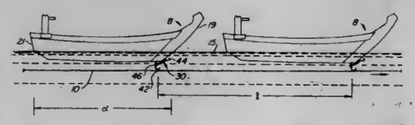


second pipe means for feeding lubrication oil from each of said actuator panels to lubrication points constituting the bearings of the revolving cylinders and rolls situated in a region proximate to said respective actuator panel, said second pipe means comprising a plurality of pipes each leading from a respective one of said actuator panels to a respective lubrication point associated with said respective actuator panel, and

third pipe means for feeding lubrication oil from said lubrication points to said at least one oil-lubrication storage means,

each of said actuator panels comprising a plurality of flow regulation means for regulating the quantity of the flow of lubrication oil through a respective one of said pipes of said second pipe means associated with said actuator panel, each of said regulation means comprising an oil-flow regulation valve, an actuator motor for actuating said oil-flow regulation valve, measurement means for measuring the oil flow through said oil-flow regulation valve and a regulation circuit for controlling said actuator motor.

5,813,497
METHOD AND APPARATUS FOR SERVING AND DISPLAYING FOOD
Yukio Iwamoto, and Masako Iwamoto, both of 1 James Ave., Atherton, Calif. 94027
Division of Ser. No. 620,098, Mar. 21, 1996, abandoned. This application Feb. 20, 1997, Ser. No. 803,293
Int. Cl.[6] B65G *53/02*
U.S. Cl. 186—49 **13 Claims**



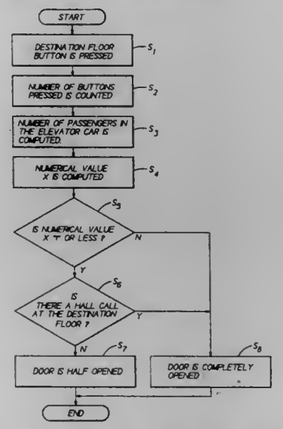
9. A method for serving and displaying food comprising:

providing a continuous watercourse containing water and a continuous, elongate element extending around the watercourse underneath the surface of the water;

removably attaching a plurality of food carriers to the continuous element such that the food carriers freely float on the water surface, the removably attaching step comprising wrapping a loop portion of a flexible elongate element around an engaging element on the food carrier; and

spacing the food carriers away from each other along the continuous element.

5,813,498
ELEVATOR DOOR SYSTEM HAVING VARIABLE OPENING/CLOSING WIDTH
Kazuhiro Hattori, Yamato, and Hideyuki Honma, Kawasaki, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.
Filed May 14, 1996, Ser. No. 645,851
Claims priority, application Japan, May 22, 1995, 7-122037
Int. Cl.[6] B66B *13/14*
U.S. Cl. 187—324 **1 Claim**

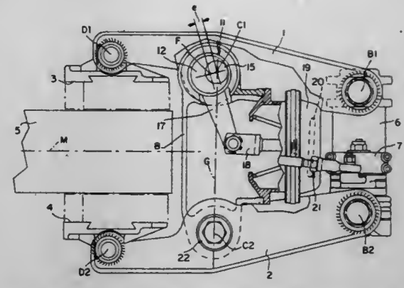


1. An elevator door system with variable opening/closing width, characterized in that the system comprises a hall button at a loading area of a hall for causing generation of a hall call for calling an elevator car to the hall, multiple destination floor buttons in the elevator car which indicate a destination floor of the elevator car when pressed, a load sensor for measuring a load applied to the elevator car, a door operator for opening the door completely or opening the door less than a completely opened width, and a controller including a memory which contains software instructions for receiving input signals from said hall button, destination floor buttons, and load sensor, for outputting a drive signal to said door operator, for computing a number of passengers in the elevator car from a load measured by said load sensor, for calculating a result obtained by dividing the number of passengers by the number of destination floor buttons pressed, and for causing an output signal to be output from said door operator if the result of said calculating step is one or less and a hall call is not generated at said destination floor, the output signal being a signal which controls opening the door less than the completely opened width.

5,813,499
BRAKE CALIPER UNIT FOR VEHICLE AND ESPECIALLY RAIL VEHICLE DISC BRAKES
Josef Staltmeir, Munich; Erich Fuderer, Germering, and Oskar Sponfeldner, Mühldorf, all of Germany, assignors to Knorr-Bremse Systeme Fur Schienenfahrzeuge GmbH, Munich, Germany
PCT No. PCT/DE95/00872, § 371 Date Feb. 27, 1997, § 102(e) Date Feb. 27, 1997, PCT Pub. No. WO96/07576, PCT Pub. Date Mar. 14, 1996
PCT Filed Jul. 5, 1995, Ser. No. 809,201
Claims priority, application Germany, Sep. 2, 1994, 44 31 353.5
Int. Cl.[6] F16D *65/16;65/32*
U.S. Cl. 188—59 **14 Claims**

1. A brake caliper unit for disc brakes of vehicles comprising:

two caliper levers extending approximately in parallel side-by-side;



brake pads linked to one end of the caliper levers and can be pressed against a brake disc;

central regions of the caliper levers swivellably coupled to a housing;

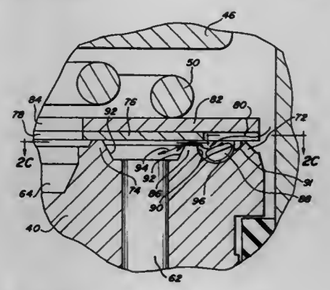
a slack adjusting device swivellably linked to other, opposite ends of the caliper levers;

a brake cylinder mounted to the housing to lie between the central regions of the caliper levers;

at least one eccentric transmission coupling the brake cylinder to the central region of one of the caliper levers; and

the eccentric transmission including a crank arm driven by the brake cylinder and a shaft and an eccentric pin combination rotatably disposed on the housing and coupling the crank arm and the one caliper lever.

5,813,500
ANTI-SWISH MECHANISM FOR A DAMPER
Stefan Deferme, Heusden-Zolder, Belgium, assignor to Tenneco Automotive Inc., Lake Forest, Ill.
Filed Mar. 25, 1996, Ser. No. 622,563
Int. Cl.[6] F16F *9/50*
U.S. Cl. 188—282.8 **10 Claims**



1. A damper comprising:

a pressure cylinder forming a working chamber operable to store damping fluid;

a piston rod at least partially disposed within said pressure cylinder;

a piston body disposed in said pressure cylinder and secured to said piston rod, said piston body separating said working chamber into a first portion and a second portion;

a continuously open flow path extending between said first and said second portions of said working chamber;

a first annular axially extending land being concentric with said piston body;

a second annular axially extending land being concentric with said piston body;

a plurality of axially extending, circumferentially spaced flow ports formed concentrically with said piston body between

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said first annular axially extending land and said second annular axially extending land; and

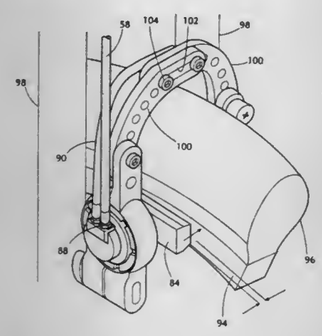
anti-swish means positioned adjacent to said circumferentially spaced flow ports for reducing swish noise as said piston body moves in said pressure cylinder, said anti-swish means being disposed within said open flow path and including an annular axially extending sub-land being concentric with said piston body and positioned between said first annular axially extending land and said second annular axially extending land.

5,813,501

HAND OPERATED HYDRAULIC VEHICLE BRAKE

Maurice C. Terry, Sr., 13922 SE. 44th St., Bellevue, Wash. 98006

Filed Oct. 18, 1996, Ser. No. 733,965
Int. Cl.[6] B60T *11/00*
U.S. Cl. 188—344 **8 Claims**



1. A hydraulic brake system for a wheeled vehicle comprising:

a master hydraulic cylinder,

a brake actuating lever associated with said master cylinder to compress hydraulic fluid within said master cylinder upon actuation of said brake actuating lever,

a hydraulic fluid transfer line extending from said master cylinder to a pair of hydraulic slave cylinders positioned on each side of a wheel,

each said slave cylinder including brake pads to contact braking surfaces on a wheel of said vehicle,

a bracket assembly for mounting on a frame support member of said vehicle to mount said hydraulic slave cylinders,

said bracket assembly including a first mounting structure permitting lateral adjustability and a second mounting structure permitting vertical adjustability thereby to position said brake pads adjacent said wheel braking surfaces, and

wherein said bracket assembly and each said slave cylinder are configured to permit substantial universal rotational movement of each slave cylinder with respect to said bracket assembly.

5,813,502

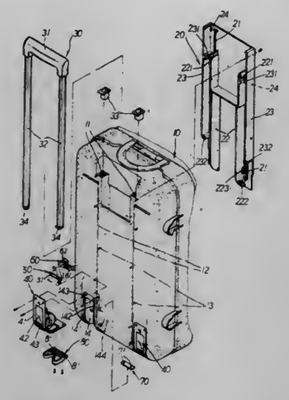
Patent Not Issued For This Number

5,813,503

LUGGAGE CASE STRUCTURE WITH RETRIEVABLE HANDLE AND WHEELS

Yuan-Chi Chang, No. 66, Lane 71, Sec.1, Fu-Kuang Rd., Tai-chung, Taiwan

Filed Nov. 18, 1996, Ser. No. 751,398
Int. Cl.[6] A45C *5/14*
U.S. Cl. 190—18 A **2 Claims**



1. A luggage case having a case body and a retractable handle movable between extended and retracted positions, the handle having two rods joined by a handle bar at a first end, each of the rods having a second end, the luggage case comprising:

a) a plurality of retractable wheel assemblies attached to the case body, each retractable wheel assembly comprising:

i) a wheel plate attached to the case body, the wheel plate having a wheel groove opening, a wall located on opposite sides of the wheel groove opening, each wall having an elongated slot with a first portion extending at an oblique angle to a second portion;

ii) a wheel receiving seat having a wheel rotatably attached thereto the wheel receiving seat pivotally connected to the wheel plate such that the wheel is movable between extended and retracted positions relative to the case body;

iii) a pivot member comprising a pair of interconnected spaced apart elongated plates, each plate having first and second ends with a pivot hole at each end, the pivot member pivotally connected to the wheel receiving seat at the first ends;

iv) a control member;

v) a pivot pin passing through the elongated slots of the wheel plate, the second ends of the plates of the pivot member and the control member to pivotally connect these elements together;

vi) a control pin connected to the control member; and,

vii) a spring acting between the control member and the wheel plate to bias the wheel toward the extended position; and,

b) a generally "L-shaped linking member having a first leg in contact with the control pin and having a second leg, the linking member being pivotally connected to the wheel plate adjacent to a juncture of the first and second leg;

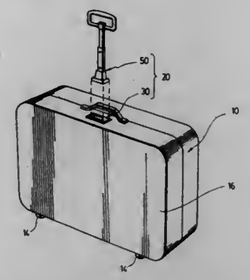
whereby one of the rods of the handle contacts the second leg of the linking member when the handle is in the retracted position so as to move the linking member about its pivot point thereby causing movement of the control pin to overcome the spring biasing force and move the wheel to the retracted position and movement of the handle to the extended position moves the associated rod out of contact with the second leg enabling the spring to move the wheel to the extended position.

5,813,504

REMOVABLE HANDLE ASSEMBLY FOR LUGGAGE

Joseph Iny, 306 Barton Ave., Ville Mont-Royal Québec, Canada, H3P 1N1, and Albert Amar, 765 place Stewart, Ville St-Laurent Québec, Canada, H4M 2X2

Filed Feb. 13, 1997, Ser. No. 800,183
Int. Cl.[6] A45C *13/22;13/26*
U.S. Cl. 190—116 **6 Claims**



1. A removable handle assembly for luggage, the assembly comprising:

two rigid members, one being a first rigid member connectable to the luggage, and another being a second rigid member comprising a hand-grip;

an alignment peg projecting from one of the two members and insertable into a corresponding alignment hole provided in the other of the two members;

a plurality of bosses projecting from one of the two members and insertable into shallow bores provided on the other of the two members, when the two members are in a locking engagement;

a connecting means for removably connecting the second member to the first member in a pivot locking engagement, the first and the second member being in locking engagement by adjoining the second member with the first member and pivoting the second member, the connecting means comprising:

a projecting part outwardly projecting from one of the two members, the projecting part comprising at least two flanges; and

a socket located in the other of the two members to receive the projecting part when the first and the second member are adjoined, the socket comprising at least two flanges, each corresponding to one flange of the projecting part to imbricate therewith upon pivoting of the second member with reference to the first member.

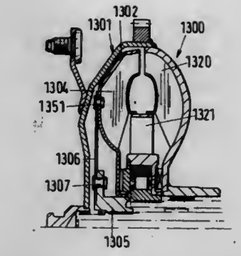
5,813,505

HYDROKINETIC TORQUE CONVERTER

Steven Olsen, Bühl; Johannes Hahn, Gernsbach, both of Germany; Volker Middelmann, Wooster, Ohio; Hubert Friedmann, Muggensturm, and Marc Meisner, Bühl-Weitenung, both of Germany, assignors to LuK Getriebe-Systeme GmbH, Bühl/Baden, Germany

Filed Jul. 18, 1996, Ser. No. 685,198
Claims priority, application Germany, Jul. 19, 1995, 195 26 123.2; Jul. 20, 1995, 195 35 653.5
Int. Cl.[6] F16H *45/02*
U.S. Cl. 192—3.28 **17 Claims**

4. A hydrokinetic torque converter comprising a housing; a pump provided in said housing and rotatable about a predetermined axis; means for rotating said pump about said axis; a rotary turbine disposed in said housing between a wall of said housing and said pump, as seen in the direction of said axis; a rotary hub at said axis, said turbine being non-rotatably connected with and being movable relative to said hub in the direction of said axis; a



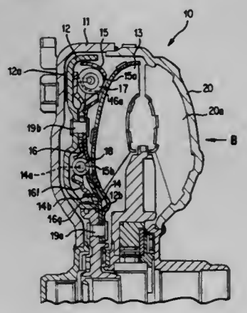
stator in said housing; and a torque transmitting lockup clutch in said housing between said wall and said turbine, said turbine including a shell having a portion remote from said axis and said clutch having at least one friction lining carried by said portion of said shell.

5,813,506

DIRECT-COUPLED CLUTCH FOR TORQUE CONVERTER

Hiroaki Maeda, Toyota; Kazuo Ishikawa, Hoi-gun, and Yuzo Masuda, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 13, 1996, Ser. No. 713,472
Claims priority, application Japan, Sep. 14, 1995, 7-237216
Int. Cl.[6] F16H *45/02;* **F16D** *13/64*
U.S. Cl. 192—3.29 **24 Claims**



1. A torque converter comprising:

a front cover for being connected to an input shaft; a piston clutch plate having a frictional facing adapted to bear against an inner surface of said front cover; a turbine for being connected to an output shaft;

a driven plate connected to said turbine and secured to said piston clutch plate for rotation in unison therewith;

a disk circumferentially movably arranged between said piston clutch plate and said driven plate;

a first resilient member for absorbing torque variation between said piston clutch plate and said disk;

and a second resilient member for absorbing torque variation between said disk and said turbine;

wherein said driven plate has a first receiving part for receiving said first resilient member and a second receiving part formed radially more inwardly than said first receiving part for receiving said second resilient member;

said driven plate has a first pawl for circumferentially compressing said second resilient member and a second pawl formed radically more inwardly than said first pawl; and

said disk has a retaining portion for circumferentially compressing said first resilient member.

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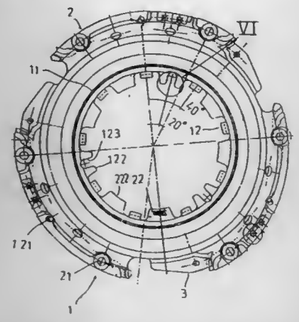
5,813,507
DIAPHRAGM CLUTCH COVER WITH STOP LUGS CAPABLE OF DISTINGUISHING BETWEEN DIFFERENT COVER TYPES

Claude Brazier, and Raymond Hagnere, both of Aimens, France, assignors to Valeo, Paris, France

PCT No. PCT/PR95/00926, § 371 Date May 20, 1996, § 102(e) Date May 20, 1996, PCT Pub. No. WO96/03589, PCT Pub. Date Feb. 8, 1996
PCT Filed Jul. 11, 1995, Ser. No. 617,863
Claims priority, application France, Jul. 27, 1994, 94 09397
Int. Cl.[6] F16D *13/58*
U.S. Cl. 192—89.23 **4 Claims**

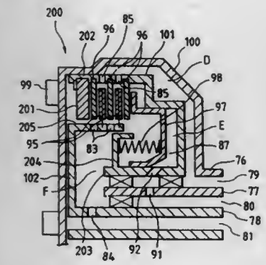


1. A cover plate for a diaphragm clutch mechanism, said cover plate having a central hole circumscribed by an inner periphery, said cover plate comprising: fastening lugs (12) for a diaphragm, which are disposed at said inner periphery of said cover plate and alternately with abutment lugs (22) adapted to cooperate with the diaphragm, wherein a set of said abutment lugs (122) are formed with a through notch each adapted to accommodate a rod passing therethrough and being spaced apart at regular intervals on a circle, said notches being disposed in a particular arrangement corresponding to a particular length of said fastening lugs.

5,813,508
STARTING CLUTCH

Masao Shoji, Fujisawa, and Yasubito Koike, Iwata, both of Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Dec. 18, 1996, Ser. No. 768,933
Claims priority, application Japan, Dec. 18, 1995, 7-328931; Apr. 2, 1996, 8-079962
Int. Cl.[6] F16D *25/00;13/72*
U.S. Cl. 192—113.34 **13 Claims**

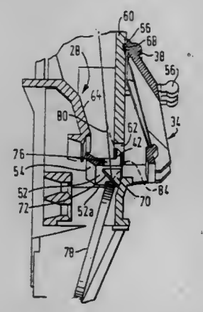


1. A starting clutch for a transmission comprising an input shaft having a center hole extending in the axial direction thereof, a shaft member disposed radially outwardly of said input shaft, a clutch case disposed radially outwardly of said shaft member and containing a clutch portion and a clutch piston therein, and a housing containing said clutch case therein, characterized by the provision of a cooling oil path defined between the center hole of said input shaft and said clutch portion and supplying oil for cooling the frictional surface of said clutch portion, an operating oil path defined between said input shaft and said shaft member and between said clutch case and said clutch piston and supplying oil for operating said clutch portion, and a drain oil path defined between said housing and said clutch case and between said shaft member and said housing and discharging the cooling oil having cooled said frictional surface, said cooling oil path and said drain oil path being provided independently of said operating oil path.

5,813,509
COIN GATE

Stephen Charles Boxall, and Paul Robert Fletcher, both of Surrey, United Kingdom, assignors to Mars Incorporated, McLean, Va.

PCT No. PCT/GB95/02126, § 371 Date Mar. 5, 1997, § 102(e) Date Mar. 5, 1997, PCT Pub. No. WO96/07991, PCT Pub. Date Mar. 14, 1996
PCT Filed Sep. 7, 1995, Ser. No. 793,649
Claims priority, application United Kingdom, Sep. 9, 1994, 9418158
Int. Cl.[6] G07F *1/04*
U.S. Cl. 194—203 **16 Claims**

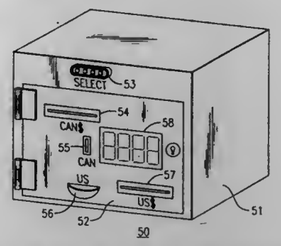


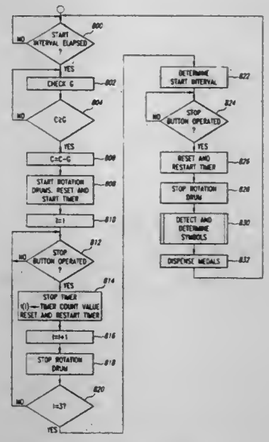
15. Coin-handling apparatus comprising a coin gate, the coin gate comprises a blocking member movable between an open position for allowing a coin to move past a side of the gate, and a closed position for blocking the path of the coin, and trapping means on the gate member adapted to trap a tethered coin against the blocking member if the coin is pulled back from the gate exit towards the blocking member by its tether, said trapping means comprising an opening extending away from said side of the member for receiving the tether, wherein the trapping means further comprises a coin hooking portion located on said blocking member and extending therefrom at least partly in the direction of travel of a coin through the gate, the opening and the hooking portion being so arranged that as the tethered coin is pulled back with the tether located in the opening, the hooking portion is located between the coin and said side of the blocking member.

5,813,510
CURRENCY AND COIN-ACTIVATED DROP SAFE

Darrell G. Rademacher, New Port Richey, Fla., assignor to XCP, Inc., Dryden, N.Y.

Filed Dec. 5, 1996, Ser. No. 760,495
Int. Cl.[6] G07F *7/04*
U.S. Cl. 194—206 **8 Claims**





1. Point-of-sale drop safe and change making mechanism, comprising

a secure lockable cabinet having a lockable door, an interior, and an exterior;

a cash drop that is movable between open and closed positions and includes means for receiving money, when the cash drop is in its open position, for storage in the secure locking cabinet, and for releasing said money, when the cash drop is in its closed position, into a cash drop receptacle in the interior of said secure locking cabinet;

a currency acceptor disposed in the interior of said secure locking cabinet for accepting paper currency bills and having an acceptor slot accessible through a penetration in said secure locking cabinet to accept and register paper currency bills inserted therein;

money dispensing mechanism disposed in the interior of said secure locking cabinet containing a supply of coins of a plurality of denominations, a receptacle for coins dispensed from said supply located on the exterior of said secure locking cabinet, and dispensing means for dispensing coins from said supply through a penetration in said secure locking cabinet to said receptacle for coins;

a money selection mechanism including a plurality of user-actuable coin select switches disposed on the exterior of said secure locking cabinet corresponding respectively to said coin denominations; and

a control mechanism in the interior of said secure locking cabinet coupled to said currency acceptor, said money select mechanism, and said money dispensing mechanism, for storing a money credit amount in response to insertion of paper currency into said currency acceptor, enabling said coin select switches to cause said money dispenser to dispense said coins in selected denominations, and decrementing said credit amount as said money dispensing mechanism dispenses said coins.

5,813,511
SLOT MACHINE

Takatoshi Takemoto, and Kenji Yamamoto, both of Taito-ku, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

PCT No. PCT/JP95/00030, § 371 Date Jul. 18, 1996, § 102(e) Date Jul. 18, 1996, PCT Pub. No. WO95/19208, PCT Pub. Date Jul. 20, 1995
PCT Filed Jan. 12, 1995, Ser. No. 676,319
Claims priority, application Japan, Jan. 18, 1994, 6-003699
Int. Cl.[6] G07F *17/34*
U.S. Cl. 194—217 **3 Claims**

1. A slot machine for accepting input of game play media and executing a game play, said slot machine comprising:

a change display section having a plurality of symbol sets each of which has a plurality of symbols, the change display section for displaying symbols and for changing symbols to be displayed in each of the symbol sets;

dispensing mechanism for dispensing game play media in response to a dispensing instruction;

a game play media detector for detecting the input game play media;

a stop instruction section for accepting an instruction from a user to stop a change display of symbols said stop instruction section having a plurality of stop buttons corresponding to a number of plurality of symbol sets; and

a control section for controlling an operation of said change display section and said dispensing mechanism; wherein

said control section executes

a setting operation for setting a start interval as a time interval between a time when the change display has stopped in said change display section and a time when the change display starts again;

a monitoring operation for monitoring whether or not the start interval elapses after the change display of said change display section stops;

a calculating operation for finding the number of game play media detected by said game play media detector and for finding a credit count equivalent to the number of game play media available for game play based on the number of game play media detected by said game play media detector and the number of game play media spent for the game play;

a first determining operation for determining whether or not the credit count is equal to or greater than a predetermined threshold value;

a starting operation, when the credit count is determined equal to or greater than the predetermined threshold value, for giving a start instruction to said change display section in a case where the monitored start interval has elapsed;

a stop operation for accepting a stop instruction from said stop instruction section for causing said change display section to stop, and for giving said stop instruction to said change display section;

a second determining operation for determining, when the change display has stopped, whether or not a combination of displayed symbols each of which is one of said plurality of symbols in said symbol sets is a predetermined win condition; and

a dispensing operation for giving said dispensing instruction to said dispensing mechanism for dispensing a predetermined number of game play media when the combination is determined to be the win condition; and

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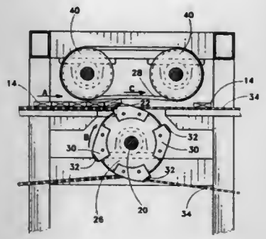
wherein said control section sets a length of the start interval for the next play based on an average of a time period since the change display of the symbol sets in said change display section starts until said control section accepts the stop instruction from one of the stop buttons, a time period since said control section accepts the stop instruction from the one of the stop buttons until said control section accepts another stop instruction from another one of the stop buttons and at least a start interval currently being used.

5,813,512
SINGULATOR AND ALLOCATOR ELONGATED MEMBERS
Bert L. Andersson, and Douglas A. Foster, both of Salmon Arm, Canada, assignors to Newnes Machine Ltd., Salmon Arm, Canada
Filed Mar. 15, 1996, Ser. No. 616,201
Claims priority, application Canada, May 23, 1995, 2149948
Int. Cl.[6] B65B *47/26*
U.S. Cl. 198—459.5 **9 Claims**



1. A stick allocator for transferring and accelerating laterally aligned sticks between a holding location on a longitudinal in-feed transfer means and a high-speed longitudinal out-feed transfer means, comprising:

a lower, selectively rotatable, stick lifting and translation means, disposed generally beneath said holding location, for frictionally engaging a lower surface of a stick held laterally in said holding location and lifting said stick so as to frictionally engage an upper surface of said stick with an upper selectively rotatable stick receiving and translating means, disposed generally above said holding location, said upper selectively rotatable stick receiving and translating means for frictionally engaging said upper surface of said stick and biasing said stick against said lower selectively rotatable stick lifting and translating means,

said upper selectively rotatable stick receiving and translating means and said lower selectively rotatable stick lifting and translating means for selectively translating and accelerating said stick held between said upper selectively rotatable stick and translating means and said lower selectively rotatable stick receiving and translating means in a forward longitudinal direction from said holding location so as to selectively deposit said stick onto said high-speed longitudinal out-feed transfer means,

wherein said stick has thickness between said upper surface and said lower surface, and wherein said lower-selectively rotatable stick lifting and translating means comprises a radially extending cam means for fictionally engaging said lower surface of said stick held laterally in said holding location-said radially extending cam means selectively rotatable about a lateral axis of rotation,

said holding location having a stop for holding a stick in upstream abutted relation thereto, said lateral axis of rotation a first vertical distance beneath said holding location, said radially extending cam means extending radially a second distance from said lateral axis of rotation, and wherein said second distance is greater than said first vertical distance,

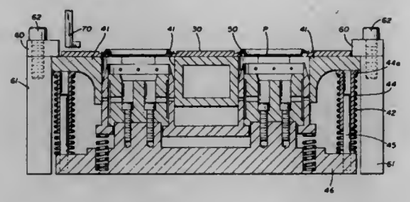
and wherein said upper selectively rotatable stick receiving and translating means comprises a continuous, selectively rotatable, stick engaging surface selectively rotatable in a longitudinal direction corresponding to said longitudinal direction of rotation of said selectively rotatable radially extending cam means, said continuous stick engaging surface selectively rotatable at a longitudinal velocity corresponding to a longitudinal velocity of said radially extending cam means,

and wherein said continuous stick engaging surface is resiliently deformable, and, when in non-deformed state, a third vertical distance generally vertically above said lateral axis of rotation,

the difference between said first vertical distance and said third vertical distance less than said thickness of said stick,

and wherein said upper selectively rotatable stick receiving and translating means and lower selectively rotatable stick lifting and translating means are simultaneously selectively rotatable, so as to lift a stick from said holding location, resiliently pinch said stick, and accelerate said stick onto said-high-speed longitudinal out-feed transfer means.

5,813,513
CONVEYOR APPARATUS
William L. Taube, North Canton, Ohio, assignor to Redicon Corporation, Canton, Ohio
Filed Dec. 26, 1995, Ser. No. 578,041
Int. Cl.[6] B65G *17/36*
U.S. Cl. 198—803.14 **11 Claims**



1. Apparatus for moving articles on an endless conveyor belt, comprising:

(a) at least one pair of rigid support plates disposed beneath the belt and normally in contact with and supporting the belt;

(b) resilient means underlying said support plates and engaging the same to resiliently support the belt;

(c) said conveyor belt being disposed within a press having an upper platen and a base;

(d) said upper platen and said base carrying forming tooling;

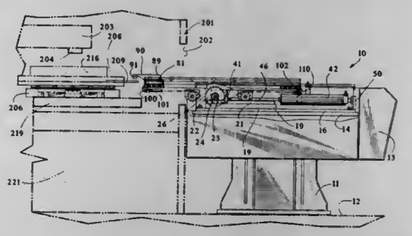
(e) said upper platen being movable toward and away from said base; and

(f) means carried by said upper platen for engaging and moving said belt from a position above said neutral plane to a position below said neutral plane against the force of said resilient means upon movement of said upper platen toward said base.

5,813,514
AUTOMATED END LOADING PALLET SYSTEM
Malcolm E. Keith, West Chicago, Ill., assignor to Midaco Corporation, Elk Grove Village, Ill.
Filed Dec. 19, 1995, Ser. No. 575,138
Int. Cl.[6] B65G *37/00*
U.S. Cl. 198—346.2 **8 Claims**

1. an automatic pallet changing machine for an automatic machining center which has a control for machining tools and for a movable machining carriage comprising:

a pallet moving member mounted adjacent said automatic machining center and having a first pallet extending plate mounted on said pallet moving member;



first driving means connected to said first pallet extending plate to move it toward and away from said automatic machining center;

a first pallet moving means movably mounted on said first pallet extending plate and movably mounted thereon;

second driving means connected to said first pallet moving means to move it;

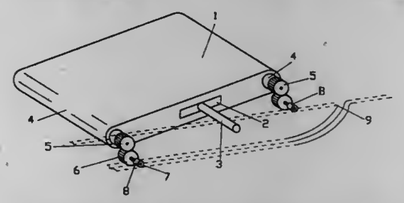
a first pallet movably mounted on said first pallet extending plate and engageable with siad first pallet moving means;

a pallet receiver mounted on said machining carriage and having upper and lower portions which are movable in the vertical plane relative to each other;

third driving means connected to said upper and lower portions to move them relative to each other;

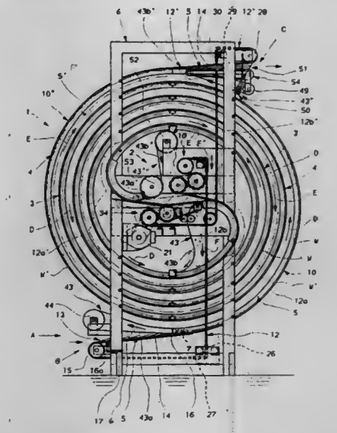
a control for said automatic machining center connected to said first, second and third driving means and to said machining carriage to move said machining carriage and said pallet receiver adjacent said first pallet extending plate, said control energizing said first, second and third driving means to raise said upper portion of said pallet receiver and to then extend said first pallet extending plate and said first pallet movable means so as to move a pallet from said pallet moving member onto said pallet receiver.

5,813,515
SORTING MACHINE WITH ALWAYS TILTED TRANSPORTATION PLANES
Nedo Gennari, Genova, and Andrea Faure, Genova Sanpierdarena, both of Italy, assignors to Finmeccanica S.p.A., Roma, Italy
Filed May 24, 1996, Ser. No. 653,452
Claims priority, application Italy, Jul. 4, 1995, MI95A1427
Int. Cl.[6] B65G *47/46*
U.S. Cl. 198—370.05 **7 Claims**



1. A sorting machine comprising a plurality of dollies, each dolly provided with a rotating mat forming a transportation and discharging plane for objects, said dollies being dragged along a fixed path, the sorting machine comprising: means for keeping the dollies in a tilted position while they are dragged along the fixed path, gear wheels on an outside of each of said dollies, each mat having a support roller shaft, said gear wheels being fit on said mat support roller shafts, racks being provided level with object discharge areas for the objects, said racks being mounted on movable supports that are suited to bring them from a position in which they do not meddle with the fixed path to a position in which they engage said gear wheels, thereby causing the mat to rotate.

5,813,516
APPARATUS FOR CONVEYING ARTICLES, IN PARTICULAR SHEET-LIKE, FLEXIBLE PRODUCTS
Werner Honegger, Bäch, Switzerland, assignor to Ferag AG, Hinwil, Switzerland
Filed Oct. 16, 1995, Ser. No. 543,354
Claims priority, application Switzerland, Mar. 16, 1995, 00751/95
Int. Cl.[6] B65G *15/16*
U.S. Cl. 198—604 **35 Claims**



1. An apparatus for conveying articles, comprising:

a spiral conveying section disposed around a center;

an inlet for said apparatus offset radially with respect to said center;

said spiral conveying section including a stationary guide path having a supporting surface that faces outwardly away from said center for supporting the articles on their inwardly facing side;

said spiral conveying section having a conveying system for conveying the articles along said stationary guide path;

said conveying system including a driven endless flexible conveying element that circulates around said spiral conveying section and is adapted to engage the articles to be conveyed on their outwardly facing side;

said conveying system including an endless flexible support member that overlays said guide path and is guided such that it circulates around said spiral conveying section and is adapted to support the articles on its inwardly facing side.

5,813,517
VIBRATORY PARTS FEEDING SYSTEM
Robert M. Logeman; Douglas C. Logeman; Robert G. Price, and Roy W. Howitt, all of Greensboro, N.C., assignors to Chase-Logeman Corporation, Greensboro, N.C.
Filed Feb. 12, 1996, Ser. No. 599,674
Int. Cl.[6] B65G *27/08*
U.S. Cl. 198—759 **32 Claims**

1. A vibratory parts feeding system, said apparatus comprising:

(a) a feeder bowl having a bottom and a generally inverted frusto-conical side wall with a spiral shaped track extending around the inner periphery of said cylindrical wall to an outlet;

(b) a vibratory base drive;

(c) a feed track positioned adjacent to and in alignment with the inlet thereof aligned with the outlet of said feeder bowl;

(d) a vibratory track drive; and

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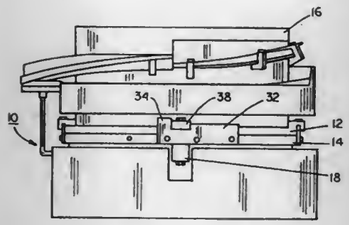
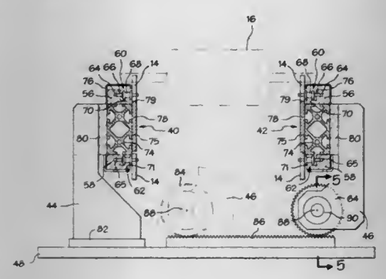


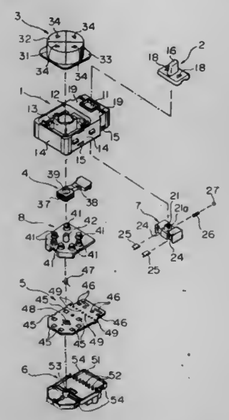
(e) a vacuum hold down system for attaching said feeder bowl to said vibratory base drive, said vacuum hold down system including: an upper plate and a lower plate having confronting surfaces, said upper plate receiving said feeder bowl onto its upper surface and said lower plate being configured on its lower surface to mount to said base drive; said upper and lower plates, when assembled, having a chamber therebetween and being sealed therearound and a vacuum port in one of said upper and lower plates through which negative pressure is applied and gas is removed; whereby said feeder bowl is coupled to said base drive and the vibrations of said base drive are transmitted to said feeder bowl.

5,813,518
CONVEYOR SYSTEM
Eric John Kirker, Vandalia, Ohio, assignor to Odawara Automation, Inc., Tipp City, Ohio
Filed May 3, 1996, Ser. No. 642,609
Int. Cl.[6] B65G *15/10*
U.S. Cl. 198—817 **16 Claims**



1. A conveyor system, comprising:
a conveyor for longitudinally conveying a workpiece;
two parallel guide rails longitudinally supporting said conveyor;
at least one fixed support supporting one of said guide rails;
a plurality of laterally mobile supports supporting the other of said guide rails; and
a positioning system for longitudinally aligning said laterally mobile supports throughout lateral movement of said laterally mobile supports;
said positioning system including a plurality of pinion gears, each of said pinion gears being rotatably mounted to a respective one of said laterally mobile supports and fully supporting said laterally mobile support;
each of said pinion gears engaging a laterally fixed rack.

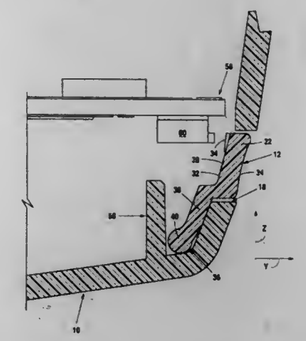
5,813,519
LIGHTED SWITCH APPARATUS
Kazunori Gotoh, Miyagi-ken, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Feb. 26, 1997, Ser. No. 806,971
Claims priority, application Japan, May 3, 1996, 8-047466
Int. Cl.[6] H01H *9/26;9/00*
U.S. Cl. 200—313 **2 Claims**



1. A lighted switch apparatus, comprising:
a slider disposed to slide along a sliding direction, said slider having two indicator portions spaced apart in the sliding direction;
a contact portion for performing switching operations by sliding said slider between a neutral position and a contact position;
light source means for illuminating said indicator portions of said slider;
a pair of light-intercepting portions, each preventing the light from said light source means from reaching an associated one of said two indicator portions; and
an opening formed between said pair of light-intercepting portions for transmitting the light from said light source means to said indicator portions in order to illuminate said indicator portions,
wherein when said slider is in the neutral position both of said indicator portions are illuminated by the light transmitted through said opening from said light source means; and
wherein when said slider is in the contact position, one of said indicator portions is prevented from being illuminated by said light-intercepting portion associated with said one of said indicator portions, whereas the other of said indicator portions is illuminated by the light from said light source means transmitted through said opening.

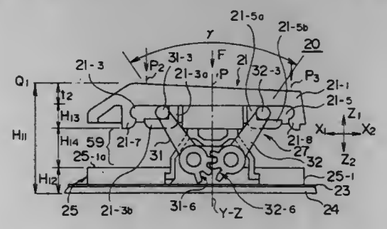
5,813,520
HOUSING AND ACTUATOR BUTTON ASSEMBLY
Bart Reier; Patrick Nixon, both of Raleigh, and Robert Doran, Cary, all of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.
Filed Jul. 17, 1997, Ser. No. 895,970
Int. Cl.[6] H01H *13/70*
U.S. Cl. 200—343 **17 Claims**

9. A housing assembly, comprising:
a housing having an internal surface and an external surface, at least one opening extending between said internal surface and said external surface, and a pair of notches disposed on the internal surface of the housing and adapted to retain respective spaced-apart end portions of a torsion beam, said pair of notches being defined by a pair of embossments each of



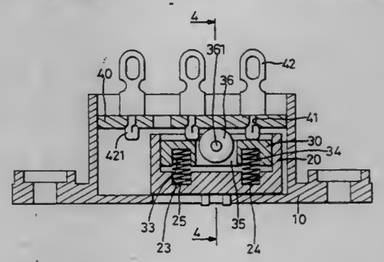
which have a lower surface extending outwardly from a portion of the interior surface of the housing, a pair of anti-rotation platforms each of which is vertically aligned and spaced from the lower surface of a respective one of said embossments, and a portion of said interior surface of the housing extending between the lower surface of each of the embossments and the respective vertically aligned anti-rotation platform; and
an actuator button having a first portion extending through said opening in the housing, and a second portion disposed within said housing, said second portion having a base from which said first portion of the actuator button extends, an elongated torsion beam spaced from said base and having a pair of spaced-apart end portions each adapted to be mounted in a respective one of said pair of notches on the internal surface of the housing and further including an intermediate portion disposed between said spaced-apart end portions, and a cantilevered beam extending between said intermediate portion of the torsion beam and said base of the actuator button and attached in respective fixed relationship to said intermediate portion of the torsion beam and to said base of the actuator button.

5,813,521
KEYSWITCH HAVING A REDUCED HEIGHT AND A KEYBOARD USING SUCH A KEYSWITCH
Tamotsu Koike; Syuji Nakamura; Junichi Maruyama; Norio Endo, and Yasuo Ootani, all of Tokyo, Japan, assignors to Fujitsu Takamisawa Component Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 579,800, Dec. 28, 1995, Pat. No. 5,657,860. This application Sep. 18, 1996, Ser. No. 715,403
Claims priority, application Japan, Aug. 11, 1995, 7-206265; Nov. 10, 1995, 7-292585; Mar. 15, 1996, 8-059464
Int. Cl.[6] H01H *13/70*
U.S. Cl. 200—344 **29 Claims**



29. A keyboard comprising a plurality of keyswitches, each of said keyswitches having:
a keytop having a keytop surface adapted for being pressed down;
a base disposed below said keytop;
an actuator disposed between said keytop and said base, said actuator deforming elastically upon pressing down of said keytop, said actuator thereby exerting a force that pushes said keytop upward upon an elastic deformation thereof;
a switch disposed so as to be actuated by said actuator, said switch changing a state thereof upon deformation of said actuator between a first, opened state and a second, closed state;
a link mechanism disposed between said base and said keytop, said link mechanism including first and second link members each having a first end slidably engaging with a principal surface of said base and a second, opposite end pivoted to said keytop at respective, first and second pivot axes, said link mechanism thereby holding said keytop on said base in a state movable to and from said base, said link mechanism further restricting a movement of said keytop to and from said base;
each of said first and second link members having a U-shaped form, including a pair of arms extending parallel with each other, each of said arms carrying a gear at a first end thereof to form a transmission part for engagement between said first and second link members, and a bridging part connecting respective second ends of said arms with each other, said bridging part forming a slide engagement with said rear surface of said keytop such that a pivoting movement of one of said first and second link members is transmitted to the other of said first and second link members at said transmission part and such that said first and second link members swing in mutually opposite directions about said first and second pivot axes;
said principal surface of said base forming a guide surface for guiding therealong said first end of said first and second link members.

5,813,522
SLIDING SWITCH
Chao-Chi Liu, No. 2, Jin-Chein 4th Street, Taichung, Taiwan
Filed Jul. 23, 1997, Ser. No. 898,914
Int. Cl.[6] H01H *15/06*
U.S. Cl. 200—550 **4 Claims**



1. A sliding switch, comprising:
a housing having a compartment defined therein,
a sliding seat slidably received in the compartment of the housing and includes a bottom plate, the bottom plate having an operative means mounted to an underside thereof to enable a user to impart sliding motion of the sliding seat in the housing,
a fixing means securely mounted in the sliding seat to move therewith, a wheel being rotatably mounted to the fixing means,
a face plate securely mounted in the housing and located above the sliding seat, the face plate including a plurality of pairs of slots, and a plurality of pairs of prongs respectively extending through the slots, the face plate further including at least two V-shape operative grooves defined in an underside thereof, the

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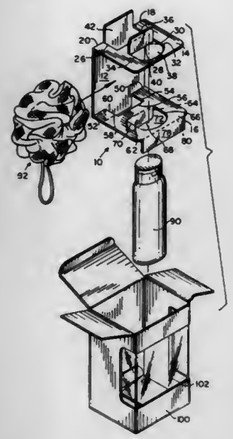
wheel being movable from one of the operative grooves to another of the operative grooves to enable said sliding seat to provide selective electrical connection between said plurality of pairs of prongs, each said operative groove including two inclined surfaces which meet at a common upper end thereof, and

means for biasing the fixing means toward the face plate such that the wheel contacts with the two inclined surfaces of the associated operative groove.

5,813,523
SELF-SUPPORTING INSERT

David Frederic Gnadt, Owings Mills, and Kevin Joseph Markey, Westminster, both of Md., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 29, 1995, Ser. No. 580,675
Int. Cl.[6] A47K *5/08*
U.S. Cl. 206—77.1 **25 Claims**



1. An insert comprising:
a) a central panel,
b) a top panel separated from said central panel by lines of weakness,
c) a bottom panel opposite said top panel and separated from said central panel by lines of weakness,
d) said top panel comprising a top stabilizing flap formed from within said top panel and attached to said top panel by a fold line,
e) a top aperture being formed in said top panel at least when said top supporting flap is folded perpendicularly to said top panel,
f) said bottom panel including a bottom supporting flap formed from within said bottom panel and attached to said bottom panel by a fold line,
g) a first bottom aperture being formed in said bottom panel at least when said bottom flap is folded perpendicularly to said bottom panel,
h) said bottom supporting flap supporting said bottom when said insert is in place in a carton,
i) said top stabilizing flap stabilizing said top panel when said insert is in place in a carton.

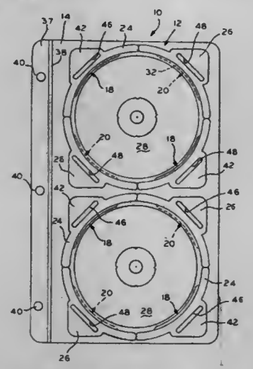
5,813,524

Patent Not Issued For This Number

5,813,525
COMPACT DISC HOLDER

Thomas Patrick McQueeny, Chicago, Ill., assignor to R.R. Donnelley & Sons Company, Lisle, Ill.

Filed Jul. 8, 1997, Ser. No. 889,649
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **27 Claims**



1. A compact disc holder, comprising:
a single thickness panel having a first surface and a second surface opposite said first surface, said first surface having first retention means for releasably retaining a compact disc and said second surface having second retention means for releasably retaining a compact disc, said retention means being disposed on said surfaces to support compact discs in superposed relation.

6. A compact disc holder, comprising:
a panel having a first disc-supporting surface and a second disc-supporting surface opposite said first disc-supporting surface, said panel being formed of thermoformed plastic having a single thickness throughout so as to be flexible but self-supporting, said first disc-supporting surface having first positively-projecting retention means for releasably retaining a compact disc in a first plane and said second disc-supporting surface having second positively-projecting retention means for releasably retaining a compact disc in a second plane generally parallel to said first plane, said first and second positively-projecting retention means being positioned to support compact discs in generally superposed relation.

19. A compact disc holder comprising:
a panel having first and second opposed disc-supporting surfaces in respective first and second generally parallel surface planes, said first and second disc-supporting surfaces each having positively-projecting retention means associated therewith for releasably retaining a compact disc in each of respective first and second generally parallel disc planes closely adjacent and parallel to corresponding ones of said first and second generally parallel surface planes, said positively-projecting retention means of said first and second disc-supporting surfaces being offset one from the other, said first and second retention means each comprising a pair of circumferentially spaced retaining segments on the respective ones of said first and second surfaces together comprising alternating positive projections and negative recesses thereby defining superposed circular disc retention areas on each of said first and second surfaces, and including a segmented disc hub support radially inwardly of each of said retaining segments on each of said first and second surfaces together comprising alternating positive projections and negative recesses centrally disposed in each of said circular disc retention areas, said segmented disc hub supports on the respective ones of said first and second surfaces being diametrically opposed with each of said segmented disc hub supports extending about the corresponding one of said circular disc retention areas by approximately 90°.

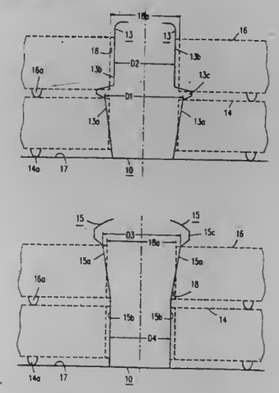
20. A compact disc holder comprising:
a panel having first and second opposed disc-supporting surfaces in respective first and second generally parallel surface planes, said first and second disc-supporting surfaces each having positively-projecting retention means associated therewith for releasably retaining a compact disc in each of respective first and second generally parallel disc planes closely adjacent and parallel to corresponding ones of said first and second generally parallel surface planes, said positively-projecting retention means of said first and second disc-supporting surfaces being offset one from the other, said panel being formed of thermoformed plastic of a single thickness throughout to be flexible but self-supporting and said retention means being disposed on said first and second surfaces so as to support discs in superposed relation.

21. A compact disc holder for a binder, comprising:
a thermoformed leaf having first and second opposed disc-supporting surfaces and a marginal edge for cooperation with a binder, said first and second disc-supporting surfaces each having positively-projecting retention means for releasably retaining a compact disc in respective first and second generally parallel planes and said positively-projecting retention means of said first and second disc-supporting surfaces being offset one from the other, said first and second positively-projecting retention means being positioned to support compact discs in generally superposed relation.

5,813,526
HOUSING

Hermann Grobecker, Garbsen, and Henning Wilhelm, Lehrte/Aligse, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1997, Ser. No. 785,148
Claims priority, application Germany, Jan. 12, 1996, 196 00 874.3; May 24, 1996, 196 20 983.8
Int. Cl.[6] B65D *85/30*
U.S. Cl. 206—308.1 **13 Claims**

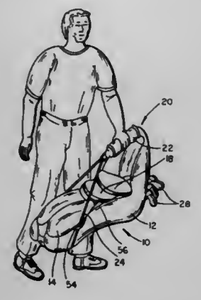


1. A housing for securing a stack of at least two information discs, each information disc having a circular central opening of a given diameter, the housing including a base plate (**10**, **17**) and a retaining device (**12**) centrally located on said base plate; said retaining device comprising:
a plurality of clamping studs (**13**, **15**) arranged in a circle and divided into at least two different groups, those in each different group having clamping surfaces (**13***a*, **15***a*) in a different respective plane;
the clamping studs (**13**, **15**) being resilient in a radial direction so that the clamping surfaces (**13***a*, **15***a*) of each group of clamping studs will securely engage the central opening of an information disc (**14**, **16**) which is placed thereon and is in the plane relevant to said group;
the clamping surfaces (**13***a*, **15***a*) being tapered in a direction toward said base plate (**10**, **17**), so that the clamping surfaces of clamping studs which are diametrically opposed have a maximum diametrical distance there-between (D_1, D_3) which is slightly greater than the diameter of the circular central opening (**18**) of an information disc; and
the clamping studs in each group also having non-clamping surfaces (**13***b*, **15***b*) which adjoin the clamping surfaces (**13***a*, **15***a*) of an adjoining group of clamping studs and extend perpendicular to said base plate (**10**, **17**), the non-clamping surfaces of diametrically opposed clamping studs in a given group having a diametrical distance there-between which is slightly smaller than the diameter of the circular central opening (**18**) of an information disc.

5,813,527
AIR BLADDER GOLF BAG

Danny S. Henrickson, 3475 Rogue River Rd., Belmont, Mich. 49306

Filed May 29, 1996, Ser. No. 654,899
Int. Cl.[6] A63B *55/00*
U.S. Cl. 206—315.3 **18 Claims**



1. A lightweight golf bag comprising:
a flexible inflatable bladder having opposing lateral edges;
a fabric panel having opposing lateral edges, the opposing lateral edges of the fabric panel joined to the opposing lateral edges of the flexible inflatable bladder, the joined flexible inflatable bladder and fabric panel defining the golf bag, the golf bag being closed at one end and open at an opposing end, whereby golf clubs may be inserted into and removed from the golf bag through the open end, the golf bag having a bottom and sidewalls defined by the flexible inflatable bladder and a top defined by the fabric panel; and
a plurality of golf club dividers located at the open end of the golf bag.

5,813,528
FISHING TACKLE STORAGE SYSTEM

Ken Bliek, 32518 Hidden Acres Dr., Sioux City, Iowa 51108, and Gary Book, 3037 Floyd Blvd., Sioux City, Iowa 51105

Filed Feb. 26, 1997, Ser. No. 806,650
Int. Cl.[6] A01K *97/06*
U.S. Cl. 206—315.11 **19 Claims**

1. A fishing tackle storage container comprising:
a support base
upper and lower plate members each having an outer perimeter and being vertically spaced and parallel with respect to each other,

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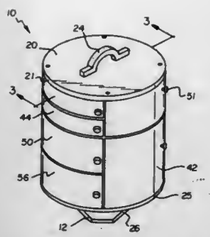


rotational mounting means mounted between said support base and said lower plate for permitting rotation about a vertical axis of said upper and lower plate members with respect to said support base,

at least two pivot rods extending between said upper and lower plates, and

at least two storage modules each said storage module being pivotally mounted on one of said pivot rods to permit said storage module to be pivoted between a closed position and an open position independently of any other said storage module, each said storage module being mounted in a manner permitting easy removal of said storage module from a mounted condition on said pivot rod and replacement by another said storage module on said pivot rod;

wherein each said storage module includes a releasable pivot hinge system for releasably pivotally mounting said storage module on a pivot rod;

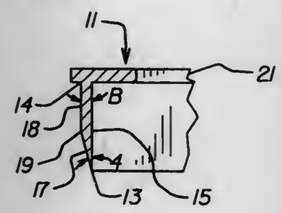
wherein said releasable pivot hinge system includes hinge means comprising spaced notches on said storage module for engaging said pivot rod; and

wherein said releasable pivot hinge system includes retaining means comprising a retainer clip pivotally mounted on said pivot rod, said retainer clip having a release means for releasably connecting to said storage module.

5,813,529
MULTIFUNCTIONAL CAP FOR A STORAGE CONTAINER

J. Thomas Goserud, 3152 Woodridge Dr., Landisville, Pa. 17538

Continuation-in-part of Ser. No. 580,611, Dec. 29, 1995, Pat. No. 5,641,064. This application Jun. 23, 1997, Ser. No. 880,794
Int. Cl.[6] B65D *85/58*
U.S. Cl. 206—315.1 **10 Claims**



1. A closure cap of monolithic construction for a tubular container, said cap comprising:

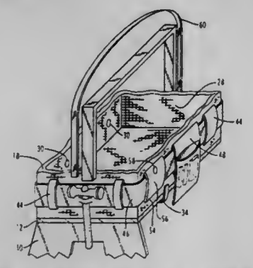
a) a collar portion of circular configuration with respect to a center axis, bounded by first and second extremities lying in parallel planes spaced apart in orthogonal relationship to said axis, an inner surface directed toward said axis and having a circular cylindrical contour with respect to said axis, and an opposed outer surface comprised of a first band portion convergently tapered toward said axis in the direction of said first extremity, and a second band portion convergently tapered toward said axis in the direction of said second extremity, said first and second band portions meeting in a circular apogee ridge representing the maximum diameter of said outer surface, and

b) a flange transversely disposed to said axis and defining a circular aperture centered upon said axis and having a diameter smaller than the diameter of said inner surface, said flange having a perimeter directed outwardly from said axis and extending beyond said outer surface.

5,813,530
LADDER MOUNTED TOOL BELT CARRIER

David A. Kornblatt, 1363 Breckford Ct., Westlake Village, Calif. 91361

Continuation of Ser. No. 364,255, Dec. 27, 1994, Pat. No. 5,649,623. This application Dec. 3, 1996, Ser. No. 753,984
Int. Cl.[6] B65D *85/00;* **E06C** *7/14*
U.S. Cl. 206—373 **19 Claims**



1. Apparatus for holding articles on a pedestal, the pedestal being the type having an upper surface and a top sidewall extending downward and below relative to the upper surface, the apparatus comprising:

a container for placement on the pedestal, the container having at least two opposing sides, an open interior for holding articles and a bottom surface configured to be disposed on the upper surface of the pedestal upon the container being placed on the pedestal; and

a plurality of belt retaining members including at least two belt retaining members disposed on each of at least two of said opposing sides of the container;

a belt supporting at least one of a pouch and a tool, said belt being retained around the container by said plurality of belt retaining members, with said at least one of a pouch and a tool extending from said belt beyond the bottom surface of said container;

wherein, upon the container being placed on the pedestal, said at least one of a pouch and a tool extending from said belt overlaps the top sidewall of the pedestal.

12. An assembly for holding articles on a pedestal, the pedestal being the type having an upper surface and a top sidewall extending downward and below relative to the upper surface, the assembly comprising the combination of:

a container for placement on the pedestal, the container having at least two opposing sides, an open interior for holding articles and a bottom surface configured to be disposed on the upper surface of the pedestal upon the container being placed on the pedestal;

at least two belt retaining members disposed on each of at least two of said opposing sides of the container; and

a belt retained by the belt retaining members.

17. A storage and support assembly for holding and supporting articles, the assembly comprising:

a pedestal having an upper surface and a top sidewall extending downward and below relative to the upper surface;

a container for placement on the pedestal, the container having at least two opposing sides, an open interior for holding articles and a bottom surface configured to be disposed on the upper surface of the pedestal upon the container being placed on the pedestal;

a plurality of belt retaining members including at least one belt retaining member disposed on each of at least two of said opposing sides of the container; and

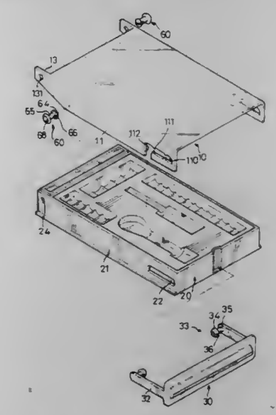
a belt retained by said plurality of belt retaining members around the container, the belt supporting at least one of a pouch and a tool;

wherein upon the container being placed on the pedestal the at least one of a pouch and a tool supported on the belt overlaps the top sidewall of the pedestal.

5,813,531
TOOL BOX ASSEMBLY

Jui-Chien Kao, No. 358, Tunghsing Rd., Shuwang Li, Tali City, Taichung Hsien, Taiwan

Filed Nov. 25, 1997, Ser. No. 978,405
Int. Cl.[6] B65D *85/28*
U.S. Cl. 206—373 **5 Claims**



1. A tool box assembly comprising:

a tool box (**20**) including two elongate side walls (**21**) each having a first end portion defining an elongate slot (**22**) longitudinally disposed and a second end portion;

an inverted U-shaped lid (**10**) including two side plates (**11**) each juxtaposed to a corresponding one of said two side walls (**21**) of said tool box (**20**) and each having a first end portion defining an inverted L-shaped channel and a second end portion pivotally mounted on said second end portion of a corresponding one of said two side walls (**11**) of said tool box (**20**), said channel of each of said two side plates (**11**) including an elongate recess (**110**) longitudinally disposed and alignable with said elongate slot (**22**) of an associated said side wall (**21**) of said tool box (**20**), and a short recess (**112**) perpendicularly disposed to said elongate recess (**110**);

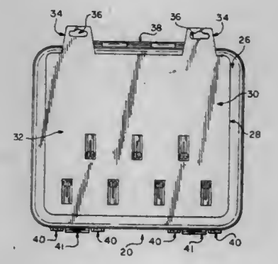
a U-shaped handle (**30**) including two legs (**32**) each slidably mounted on said first end portion of a corresponding one of said two side walls (**21**) of said tool box (**20**); and

two snapping members (**33**) each including a stub (**35**) fixedly mounted on a corresponding one of said two legs (**32**) of said handle (**30**) and slidably extending through said elongate recess (**110**) of a corresponding one of said two side plates (**11**) of said lid (**10**) and through said elongate slot (**22**) of an associated said side wall (**21**) of said tool box (**20**), and a cone-shaped enlarged head (**34**) extending from one end portion of said stub (**35**) and urged on an inner periphery of said side wall (**21**) of said tool box (**20**).

5,813,532
ROUTER BIT CASE

Kamyar Kheradpir, Greenville, N.C.; Cliff J. Von Hoene, Jeffersontown, Ky.; Grover C. Haddock, and Paul J. Simon, both of Greenville, N.C., assignors to Credo Tool Company, Woodburn, Oreg.

Filed Oct. 8, 1996, Ser. No. 727,734
Int. Cl.[6] B65D *85/24*
U.S. Cl. 206—379 **6 Claims**



1. A storage case comprising:

an upper shell and a lower shell hinged to each other at respective first ends;

an insertable tray removably positioned in an opening in the lower shell; and

the insertable tray forming at least a portion of an outer external surface of the storage case, wherein the insertable tray further comprises at least one projection located in an at least one corresponding recess in the lower shell, at least one support for supporting objects to be stored, and an aperture configured to enable mounting of the insertable tray formed in the at least one projection, said at least one support comprising at least one vertical rod support, a plurality of raised horizontal supports, and at least one set of parallel rail supports.

2. A storage case comprising:

an upper shell and a lower shell rotationally attached to each other;

an insertable tray removably positioned in an opening in the lower shell, wherein the insertable tray further comprises at least one projection, wherein the at least one projection of the insertable tray is located in the an at least one corresponding recess in the lower shell;

an upper surface of the insertable tray contacting the lower shell;

a lower surface of the insertable tray contacting the lower shell;

tray retaining elements attached to the lower shell for biasing the insertable tray against the lower shell; and,

the insertable tray forming at least a portion of an outer external surface of the storage case, said insertable tray further comprising at least one support for supporting objects to be stored and a stepped edge forming at least a portion of an edge of the insertable tray, said at least one support comprising at least one vertical rod support, a plurality of raised horizontal rod supports, and at least one set of parallel rail supports, wherein the objects to be stored are router bits.

3. A storage case comprising:

an upper shell and a lower shell hinged to each other at respective first ends;

an insertable tray removably positioned in an opening in the lower shell; and

the insertable tray forming at least a portion of an outer external surface of the storage case, wherein the insertable tray further comprises at least one projection located in an at least one corresponding recess in the lower shell, at least one support for supporting objects to be stored and an aperture configured to enable mounting of the insertable tray formed in the at least one projection.

4. A storage case comprising:

A storage case comprising:

an upper shell and a lower shell hinged to each other at respective first ends;

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an insertable tray removably positioned in an opening in the lower shell; and

the insertable tray forming at least a portion of an outer external surface of the storage case, wherein the insertable tray further comprises at least one projection located in an at least one corresponding recess in the lower shell, and at least one support for supporting objects to be stored, said at least one support comprising at least one vertical rod support, a plurality of raised horizontal supports, and at least one set of parallel rail supports.

5. A storage case comprising:

an upper shell and a lower shell rotationally attached to each other;

an insertable tray removably positioned in an opening in the lower shell, wherein the insertable tray further comprises at least one projection, wherein the at least one projection of the insertable tray located in an at least one corresponding recess in the lower shell;

an upper surface of the insertable tray contacting the lower shell;

a lower surface of the insertable tray contacting the lower shell;

tray retaining elements attached to the lower shell for biasing the insertable tray against the lower shell; and

the insertable tray forming at least a portion of an outer external surface of the storage case, said insertable tray further comprising at least one support for supporting objects to be stored and a stepped edge forming at least a portion of an edge of the insertable tray, said at least one support comprising at least one vertical rod support, a plurality of raised horizontal rod supports, and at least one set of parallel rail supports.

5,813,533

STORAGE/DISPLAY BOX FOR DRILL BITS OR THE LIKE

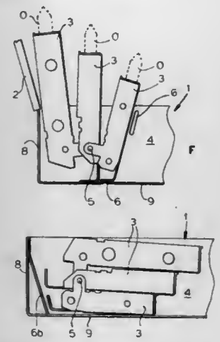
Georg Knoblauch, Giengen, Germany, assignor to Firma Georg Knoblauch, Giengen, Germany

Filed Feb. 25, 1997, Ser. No. 805,438

Claims priority, application Germany, Mar. 22, 1996, 196 11 301.6

Int. Cl.[6] B65D *85/28*

U.S. Cl. 206—379 **7 Claims**



1. A storage/display box for elongated objects, the box comprising:

a generally parallepipedal and hollow base having a pair of parallel and spaced side walls;

a cover pivotal on the base between a closed position closely engaged over the base and enclosing the base and an open position standing upward therefrom;

a holder fittable in the box and adapted to hold at least one of the objects;

means forming a pivot between the holder and the side walls for pivoting of the holder between a down position wholly received in the base and an up position projecting upward therefrom and through an intermediate position between the down and up positions; and

an elastic deformable formation engaged between the base and the holder and positioned such that it is greatly deformed in the intermediate position.

5,813,534

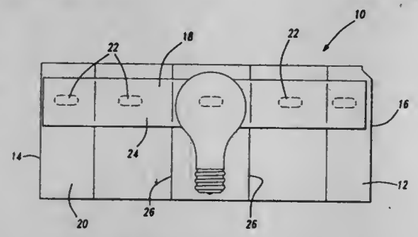
PACKAGE FOR AN ARTICLE

John A. Schamante, 1206 E. Mablo, Troy, Mich. 48083

Filed May 22, 1997, Ser. No. 861,770

Int. Cl.[6] B65D *65/00*

U.S. Cl. 206—418 **6 Claims**



1. A package for an article comprising:

an elongated sheet, said sheet having two spaced ends and a plurality of transverse fold lines which divide the sheet into longitudinally adjacent panels, one panel at one end of said sheet adapted to overlie a further panel at the other end of the sheet to form a loop,

a layer of shrink wrap material having a pair of longitudinal edges and overlying at least a portion of one side of said sheet, said layer extending along the entire length of said sheet,

means for attaching discrete portions of said shrink wrap material to at least a plurality of said panels, each of said discrete portions disposed centrally with respect to said longitudinal edges of said shrink wrap,

means for securing said ends of said sheet together to form said loop having an interior side and an exterior side, said shrink wrap layer being attached to said interior side of loop,

wherein with the article positioned within the interior side of said loop, upon application of heat to said shrink wrap material, portions of said shrink wrap material unattached to said sheet at least partially engulf the article to thereby affix the article to said sheet.

5,813,535

HOUSING DEVICE FOR CHRISTMAS LIGHT BULBS

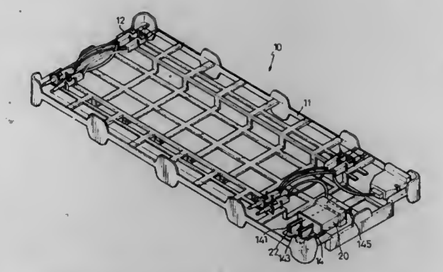
Jeou-Nan Tseng, No. 539, Sec. 4, Chunghua Rd., Hsinchu, Taiwan

Filed Sep. 16, 1997, Ser. No. 931,354

Int. Cl.[6] B65D *85/42*

U.S. Cl. 206—419 **6 Claims**

1. A housing device for Christmas light bulbs comprising a body having a plurality of seats integrally formed on opposed sides of the body for securely receiving the light bulbs therein, the improvements are:



a resilient plate is integrally formed onto the body and adjacent to one side of the seats and has a pair of spaced brackets integrally formed thereon and a groove defined therein.

5,813,536

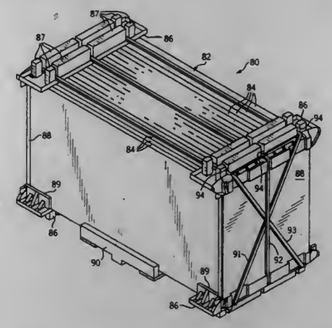
PACKAGING STRUCTURE FOR A BUNDLE OF PANELS

David M. Bartholomew, Greensburg, Pa., assignor to Menasha Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 745,166, Nov. 7, 1996. This application Mar. 27, 1997, Ser. No. 835,045

Int. Cl.[6] B65D *21/032;85/48*

U.S. Cl. 206—449 **19 Claims**



1. A packaging structure for a bundle of panels in which each panel has two major surfaces and a plurality of edge surfaces connecting the two major surfaces, wherein the plurality of edge surfaces of the panels form edge sides of the bundle, said packaging structure comprising:

a plurality of corner caps with each one located at a corner of the bundle where two edge surfaces of each panel intersect and extending across the edge surfaces of every panel, and each corner cap has a base with a retainer member extending therefrom at an angle for embracing one corner of the bundle;

a plurality of sheets with each being received within the retainer members of two of the plurality of corner caps to prevent racking of the bundle of panels; and

a plurality of strapping bands each extending around the plurality of corner caps, wherein two of the plurality of strapping bands extend across two edge sides of the bundle parallel to a length axis of the edge surfaces which form those two edge sides, and extend diagonally across two other edge sides of the bundle.

5,813,537

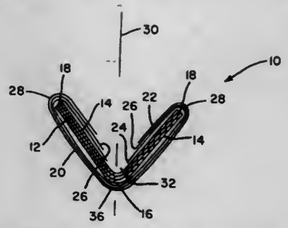
EDGE PROTECTOR HAVING RELIEVED APEX-G BOARD

Lawrence A. DeReu, Hawthorn Woods; Michael D. Loeschen, Evanston, both of Ill., and Lawrence J. Ullmann, Elizabethtown, Pa., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jul. 16, 1997, Ser. No. 895,141

Int. Cl.[6] B65D *85/30*

U.S. Cl. 206—453 **20 Claims**



1. An edge protector for protecting edges and corners of articles when disposed and secured therearound by packaging strapping, comprising:

a core member having leg members disposed at a substantially 90° angle with respect to each other, wherein said leg members have oppositely disposed distal edge portions and are integrally connected together by an apex portion, and wherein further each one of said leg members has an interior surface which is adapted to be disposed toward an article when said edge protector is disposed around an edge portion of an article to be protected by said edge protector, and an exterior surface which is adapted to be disposed away from an article and disposed toward packaging strapping when said edge protector is disposed around an edge portion of an article to be protected by said edge protector and secured at such position by packaging strapping; and

means disposed upon said leg members for providing portions upon said interior surfaces of said leg members which have progressively greater thickness dimensions as one proceeds away from said apex portion and toward said distal edge portions.

5,813,538

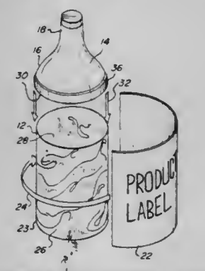
PROMOTIONAL PACKAGE

Mark S. Kaufman, Stamford, Conn., assignor to 3-Strikes Custom Design, Stamford, Conn.

Continuation-in-part of Ser. No. 567,951, Dec. 6, 1995, abandoned, which is a continuation of Ser. No. 246,968, May 20, 1994, abandoned. This application Sep. 13, 1996, Ser. No. 713,608

Int. Cl.[6] B65D *73/00*

U.S. Cl. 206—457 **14 Claims**



1. A promotional package for simulating a product package of the type having a label on the product package and having an external contour, the promotional package comprising:

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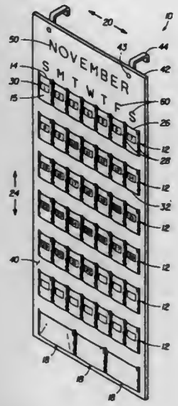
a bottom portion comprising a fabric article compressed into a shape simulating a portion of the external contour of the product package, the fabric article compressed under substantial pressure so as to be self-supporting and dimensionally stable, the compressed fabric article independently providing substantially all of the shape of the bottom portion of the product package;

at least one decorative unit having a shape simulating another portion of the external contour of the product package, the compressed fabric article being located adjacent the decorative unit; and

a flexible retainer maintaining said compressed fabric article adjacent to the decorative unit thereby forming a combined shape simulating the external contour of the product package.

5,813,539
CALENDAR ORGANIZER
Donald Francis DePalma, 1400 El Camino Village Dr., Apt.#211, Houston, Tex. 77058
Filed Aug. 28, 1997, Ser. No. 920,302
Int. Cl.[6] G09D *3/04*
U.S. Cl. 206—459.1 **4 Claims**



1. A calendar organizer, comprising:

a) six rows of seven pouches mounted to backing material, each pouch being about four and one half inches wide and about four to about five inches tall, the seven pouches in each row represents days of a week while the six rows represent weeks of a month, the pouches having a top edge unsecured to the backing material and sides and bottom edges secured to the backing material, the bottom edge of each row of pouches being about nine to about ten inches from the bottom edge of the row of the next row of pouches, the pouches further having an outer surface,

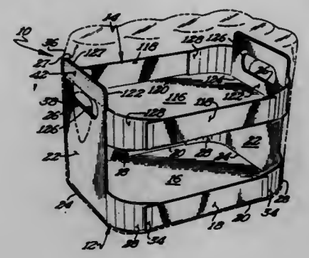
b) selective pouch numbering means, providing a means for numbering the pouches to coincide with a month of interest, the numbering means further allowing the numbering of the pouches to be changed as the month of interest changes,

c) selective pouch labeling means providing a means for labeling specific days of the month with a reminder,

d) said backing material having top, bottom and side edges, the top edge providing a means for hanging the organizer for display, said hanging means comprising a multiplicity of hanging means securely attached to the backing material top edge, said hanging means providing a means for hanging and displaying the organizer, and

e) a multiplicity of accessory pouches attached on the backing material and positioned near the backing material bottom edge, said accessory pouches providing a means for storing unused pouch numbering means, labeling means and other items.

5,813,540
SHRINK FILM-ENCASED DOUBLE-TIERED PACKAGE
Robert A. Vollbrecht, Doylestown, Pa., and Scott P. Leuschke, Alexandria, Minn., assignors to Douglas Machine Limited Liability Company, Alexandria, Minn.
PCT No. PCT/US95/14545, § 371 Date Jan. 2, 1997, § 102(e) Date Jan. 2, 1997, PCT Pub. No. WO96/23708, PCT Pub. Date Aug. 8, 1996
Continuation-in-part of Ser. No. 337,325, Nov. 10, 1994, abandoned. This PCT application Nov. 13, 1995, Ser. No. 765,993
Int. Cl.[6] B65D *65/00*
U.S. Cl. 206—497 **27 Claims**



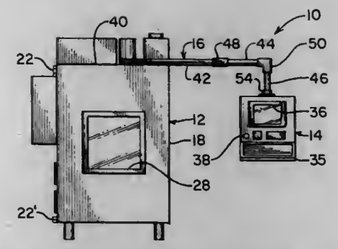
17. Package for packaging products including a tray including a base panel and first and second end walls integrally connected to the base panel about first and second fold lines, with each of the end walls including a bandgrip, with the products being supported upon the base panel intermediate the end walls; and a shrink wrapper encased around the base panel, the end walls, and the products supported upon the base panel, with the shrink wrapper drawing the end walls against the products supported upon the base panel, with the shrink wrapper including first and second openings created when the shrink wrapper was shrunk around the products and the tray, with the handgrips being accessible through the openings, characterized in the openings created when the shrink wrapper was shrunk around the products and the tray having upper peripheries at least partially coincident with the upper periphery of the handgrips of the respective first and second end walls, with the shrink wrapper providing extra strength to the handgrips in the end wall.

5,813,541
VERSATILE MOUNTING FOR CONTROL CONSOLE FOR TESTING CHAMBER
Norman J. Mottram, Niwot, Colo., assignor to QualMark Corporation, Westminster, Colo.
Continuation of Ser. No. 432,451, May 19, 1995, abandoned. This application Apr. 7, 1997, Ser. No. 838,400
Int. Cl.[6] B03B *9/00*
U.S. Cl. 209—2 **26 Claims**

1. A screening apparatus for subjecting a product to varying environmental conditions, comprising:

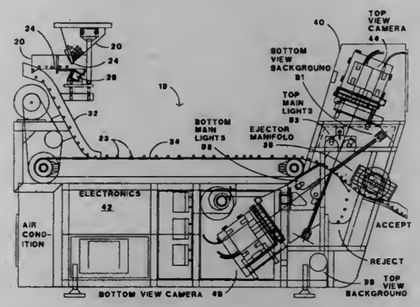
an enclosed screening chamber that is isolated environmentally from an ambient environment by top, bottom, and side walls and capable of producing a unique temperature environment within said enclosed screening chamber, wherein the product is positioned within said screening chamber when the product is subjected to the varying environmental conditions;

a console electrically connected to said screening chamber for supervising the screening apparatus; and



an arm having a proximal end and a distal end, wherein said proximal end is unrotatably connected to said screening chamber, said arm extends outwardly from said screening chamber, and said distal end is connected to said console.

5,813,542
COLOR SORTING METHOD
Avi P. Cohn, Lake Oswego, Oreg., assignor to Allen Machinery, Inc., Newberg, Oreg.
Filed Apr. 5, 1996, Ser. No. 627,359
Int. Cl.[6] B07C *5/00*
U.S. Cl. 209—581 **64 Claims**



1. A method of classifying an object comprising the steps of:

(a) sensing a multiple color image of at least a portion of said object while said object is moving;

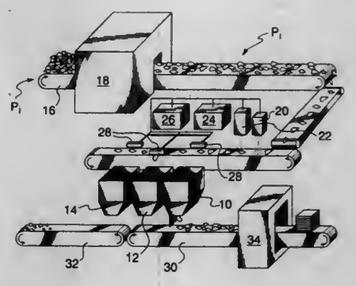
(b) producing color signals from said multiple color image indicative of a plurality of colors in response to sensing said multiple color image;

(c) transforming said color signals from said multiple color image sensed while said object is moving to a hue signal and a saturation signal; and

(d) variably classifying said object depending upon said hue signal and said saturation signal.

5,813,543
METHOD OF SORTING PIECES OF MATERIAL
Adam J. Gesing, and Tom Shaw, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada
Filed Aug. 5, 1996, Ser. No. 689,090
Int. Cl.[6] B07C *9/00*
U.S. Cl. 209—653 **15 Claims**

1. A method of sequentially sorting an input batch of pieces of material each having a composition defined by at least one control element, each of said pieces having a concentration for each of the control elements and a weight, said sorting being from the input batch into a plurality of output bins each assigned a target concentration for each of the control elements, pieces in each of said



output bins having a cumulative aggregate weight and an aggregate concentration for each of the control elements, comprising the steps of:

(a) establishing a bin order for a selected one of said pieces;

(b) calculating in the bin order an aggregate composition of the output bins after the addition of said selected piece;

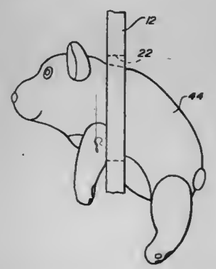
(c) placing the selected piece in a selected bin, said selected bin being the first bin for which the new aggregate composition falls within the target concentration limits for all the control elements; and

(d) repeating steps (a) to (c) for each subsequent piece in the input batch.

5,813,544

Patent Not Issued For This Number

5,813,545
APPARATUS AND METHOD FOR DISPLAY OF STUFFED ANIMALS
Robert Greenberg, 4917 Fairway Ridge Cir., West Bloomfield, Mich. 48323
Filed Mar. 12, 1997, Ser. No. 815,208
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—13.1 **19 Claims**



1. A stuffed animal display apparatus, comprising:

a first sheet member including a plurality of holes therethrough and a base portion; and

a second sheet member including a plurality of holes therethrough and a base portion, said first and second sheet members being attached to one another to support one another in a generally vertical position on said base portions;

wherein each of said holes in said first and second sheet members have a predetermined dimension and receive a figurine with displaceable stuffing.

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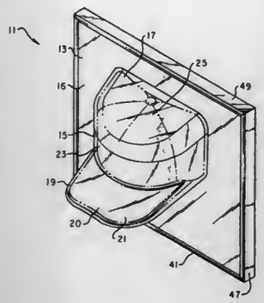
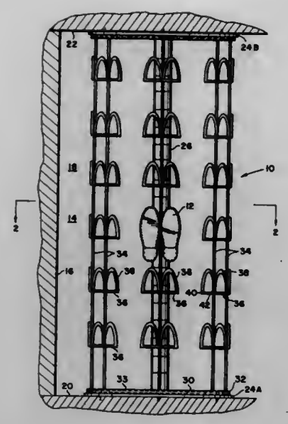
5,813,546
CAP DISPLAY APPARATUS
Stephen M. Wilson, and Joseph J. Catalano, both of 16415 Addison Rd. Suite 620, Dallas, Tex. 75248
Filed Nov. 16, 1995, Ser. No. 558,422
Int. Cl.[6] A47F *7/06*
U.S. Cl. 211—32 15 Claims



1. A cap display apparatus for displaying a cap having a bill and a collapsible crown, the crown having a front half connected to the bill, wherein the cap display comprises:
a transparent planar window piece, having a front surface and a rear surface;
an integral, transparent, hollow crown section extending out of the front surface of the window piece, the crown section having internal dimensions corresponding to, but slightly larger than the dimensions of at least the front half of the cap crown; and
an integral, transparent, hollow bill section, extending out of the crown section away from the front surface of the window piece, the bill section having internal dimensions corresponding to, but slightly larger than the dimensions of the bill, the crown section and the bill section together being canted with respect to the window piece for displaying the cap at a preselected angle.

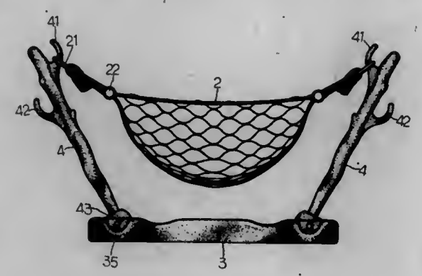
5,813,547
CLOTHING ACCESSORIES STORAGE RACK
Sherrie D. Rice, 831 Pinebrook Ct., Alpharetta, Ga. 30201
Filed Jan. 28, 1997, Ser. No. 790,684
Int. Cl.[6] A47F *5/025*
U.S. Cl. 211—34 19 Claims

1. An elongate rotatable rack providing readily accessible storage of a plurality of shoes in a clothes closet, comprising:
a pair of opposing base plates, each having a slotted channel extending around the perimeter on respective facing surfaces of the pair of base plates;
a flexible belt disposed within each of the slotted channels and each of the belts defining a plurality of substantially equally spaced-apart sockets therein;
a plurality of elongate members extending between the pair of opposing base plates, each of said elongate members engaged at respective distal ends in one of the sockets of each of the belts, the slotted channel in the bases defining a gap for receiving therethrough an end portion of the elongate members;
a plurality of spaced-apart cross-arms attached to each of the elongate members;
a pair of shoe receivers attached to each cross-arm, each shoe receiver attached at a first end to a respective distal portion of the cross-arm and at a second end to the elongate member, whereby a shoe, being inverted, is slidingly received on one of said shoe receivers,



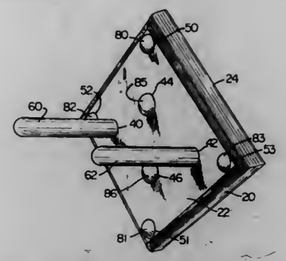
whereby shoes, being placed on the shoe receivers, are selectively viewed for retrieval by causing the belts to move along the channels.

5,813,548
ARTICLE HOLDING NET ASSEMBLY
Ching Tzong Jiang, 527, Chung-Chie Rd., Tin-Lee Village, Hsien-See Hsiang, Changhua Hsien, Taiwan
Filed Mar. 12, 1997, Ser. No. 815,198
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—85.4 6 Claims



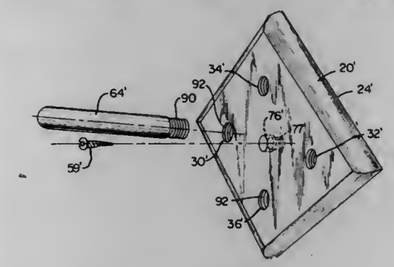
1. An article holding net assembly comprising:
a) a base having two opposite ends, a compartment having a toothed bottom wall at each opposite end;
b) a pair of support rods, each support rod including a bottom end having a ratchet wheel fastened thereto, each ratchet wheel being rotatably mounted in a compartment of the base and disposed in engagement with the toothed bottom wall thereof, the configurations of each toothed bottom wall and its engaged ratchet wheel permitting rotational movement of the ratchet wheel in only an outward direction so that the support rods may only be angled outwardly with respect to the base, each support rod further including an upper segment provided with a first hooking means; and
c) a net having two opposite ends, each opposite end including a bracing bar and a second hooking means, and the second hooking means being engageable with the first hooking means for suspending the net between the support rods.

5,813,549
STORAGE RACK
Michael P. Sheehan, 2675 S. Columbine St., Denver, Colo. 80210, and Martin D. Gaeth, 8301 E. Lehigh Dr., Denver, Colo. 80237
Filed Nov. 6, 1996, Ser. No. 746,079
Int. Cl.[6] A47F *5/08*
U.S. Cl. 211—87.01 14 Claims



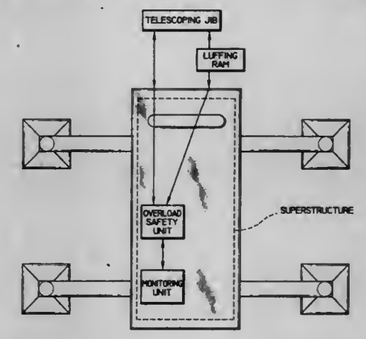
1. A storage rack apparatus comprising:
a base member attachable to an upright support surface, said base member having a front surface and a back surface;
a first pair of peg bores having passages penetrating said base member at spaced adjacent locations to one another, and being separated by a first distance;
a second pair of peg bores having passages penetrating said base member at spaced adjacent locations, and being separated by a second distance which differs from said first distance;
two elongate pegs, each of said page insertable into a respective bore of either one of said first and second pairs of peg bores;
means for interchangeably attaching said base member to said support surface where a selected one of said first and second pair of peg bores into which said pegs are inserted are in horizontally spaced relation to one another and the other of said first and second pairs of peg bores into which said pegs are not inserted are in vertically spaced relation to one another; and
said attaching means comprising a fastener insertable through each bore of said other of said first and second pairs of peg bores, thereby attaching said base member to the supporting surface.

5,813,550
STORAGE RACK WITH THREADED PEGS
Michael P. Sheehan, 2675 S. Columbine St., Denver, Colo. 80210, and Martin D. Gaeth, 8301 E. Lehigh Dr., Denver, Colo. 80237
Continuation-in-part of Ser. No. 746,079, Nov. 6, 1996. This application Jan. 24, 1997, Ser. No. 788,676
Int. Cl.[6] A47F *5/08*
U.S. Cl. 211—87.01 20 Claims



1. A storage rack apparatus comprising:
a base member attachable to a support surface and having a front surface and a back surface;
a first pair of peg bores penetrating said base member, and separated by a first distance;
a second pair of peg bores penetrating said base member, and separated by a second distance, at least one of said peg bores comprising a threaded portion; and
two elongate pegs, each of said pegs insertable into a respective bore of said first and second pairs of peg bores and at least one of said pegs comprising a threaded portion for engagement with said threaded portion of at least one of said peg bores;
wherein said first distance is substantially greater than said second distance, and wherein an imaginary line connecting said first pair of bores defines an angle with respect to an imaginary line connecting said second pair of bores means for interchangeably attaching said base member to said support surface whereby a selected one of said first and second pair of peg bores into which said pegs are inserted are in horizontally spaced relation to one another and the other of said first and second pairs of peg bores into which said pegs are not inserted are in vertically space relation to one another; and
said attaching means comprising a fastener insertable through each bore of said other of said first and second pairs of peg bores, thereby attaching said base member to the supporting surface.

5,813,551
CRANE VEHICLE
Peter Abel, Mengen, Germany, assignor to Liebherr-Werk Ehingen GmbH, Ehingen/Donau, Germany
Filed Dec. 12, 1996, Ser. No. 764,251
Claims priority, application Germany, Dec. 14, 1995, 295 19 871 U
Int. Cl.[6] B66C *15/06*
U.S. Cl. 212—278 18 Claims



1. A crane vehicle provided
with a jib hinged to a superstructure mounted upon a carrier, which jib can be luffed by means of a luffing ram which is hinged to the jib and the superstructure,
extending sliding beams which are positioned at end parts of longitudinal sides of the carrier which face each other and which are provided at the ends thereof with extending stabilizer bases, and
an overload safety unit which takes at least one of the following actions (i) and (ii):
(i) generates a signal, and
(ii) stops crane operation, when the crane reaches or exceeds limits endangering its stability,
wherein
the sliding beams are arranged to be extended to at least three stages, in each stage of which the beams are arranged to be locked in place to secure the same in the respective stage,

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a monitoring unit is provided which detects the extension state of the sliding beams and which feeds signals corresponding to the relevant extension state of the individual sliding beams to the overload safety unit, and

the overload safety unit assumes extension length of a particular sliding beam extended the shortest, as the extension state of all of the sliding beams, to determine the limits which endanger the stability.

5,813,552

TELESCOPIC BOOM WITH MULTISTAGE HYDRAULIC CYLINDER

Ernst Kaspar, Munderkingen, Germany, assignor to EC Engineering + Consulting Spezialmaschinen GmbH, Ulm, Germany

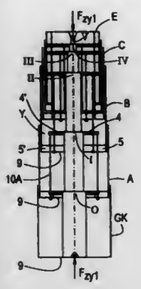
PCT No. PCT/EP94/04043, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/15911, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 5, 1994, Ser. No. 663,254

Claims priority, application Germany, Dec. 8, 1993, 96 18 847 U; May 19, 1994, 94 08 289 U

Int. Cl.[6] B66C *23/04*

U.S. Cl. 212—349 **12 Claims**



1. A telescopic boom, comprising:

a plurality of telescopic boom members, said boom members having hollow interiors for telescopically receiving said boom members inside one another;

a multistage hydraulic cylinder including a plurality of cylinder units for extending and retracting the boom members, said multistage hydraulic cylinders being located within the hollow interiors of said plurality of telescopic boom members;

a plurality of the cylinder units each having secured thereto a first component of a supporting device;

a plurality of the boom members each having secured thereto a second component of said supporting device which cooperates with the first component of said supporting device to support the hydraulic cylinder on the boom members;

wherein one of said first and second components of said supporting device includes two opposing claw members and the other of said first and second components of said supporting device includes two opposing rail members locatable within the claw members, the second components being disposed on inner walls within the interiors of said plurality of boom members;

wherein the opposing second components of an innermost of said boom members have a sufficient longitudinal length along the innermost boom member that in a retracted state all of the first components are in engagement with the opposing second components of the innermost boom member, and wherein the opposing second components of subsequent ones of said boom members are short second component pieces having a sufficient longitudinal length at the lower base area of the subsequent boom members to engage at least one of the first components and which are in alignment with said innermost boom second components, and

wherein said plurality of boom members have bottoms that are spaced apart when in a retracted state essentially only a distance corresponding to the lengths of the short second component pieces, and wherein said first components are dimensioned to bridge between neighboring ends of adjacent second components to prevent unintentional disengagement of said first components with said second components.

5,813,553

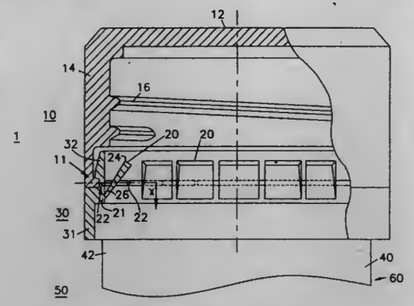
SNAP-BAND TAMPER EVIDENT

James E. Herr, East Petersburg, and Henry H. Nyman, Jr., York, both of Pa., assignors to Kerr Group, Inc., Lancaster, Pa.

Continuation of Ser. No. 487,308, Jun. 7, 1995, abandoned. This application Oct. 16, 1997, Ser. No. 951,379

Int. Cl.[6] B65D *41/34*

U.S. Cl. 215—252 **7 Claims**



1. A tamper evident closure comprising:

(a) a cap having (i) a base wall, (ii) a side wall depending from the base wall to a side wall base, and (iii) a cap ring located at the side wall base and projecting radially inwardly from the sidewall base; and

(b) a tamper evident ring which is snap fittingly engaged with the cap, the tamper evident ring comprising:

(i) a snap fit band comprising a tab constructed to slide past the cap ring when the tamper evident ring is snap fit to the cap ring, and having a shoulder which engages the cap ring to prevent unintended disassembly of the snap fit band from the cap ring;

(ii) a tamper evident band depending from the snap fit band and having a weakened area adjacent the cap ring comprising a plurality of perforations, such that the tamper evident ring is frangibly disconnected from the closure in one piece when the closure is removed from a container; and

(iii) at least three tabs molded in a direction radially inwardly for engagement with an annular retaining bead on a container.

5,813,554

ANNULAR LOCK

Antonio Marangoni Graziani, Barcelona, and José Luis Gómez Cao, Molins de Rei, both of Spain, assignors to Diseño Industrial Mago, S.L., Barcelona, Spain

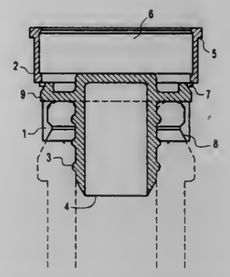
Filed Sep. 13, 1996, Ser. No. 713,802

Int. Cl.[6] B65D *45/30*

U.S. Cl. 215—274 **10 Claims**

1. An annular lock stopper for closing an aperture of a bottle having a neck with an inner wall, an upper edge which delimits the aperture, and an outer recess (8) situated below said upper edge on an outer wall, the annular lock stopper comprising:

a stopper part comprising:



a central stem (4) for insertion into the neck of the bottle, said central stem having an outer wall with sealing rings (3) for providing sealing between the outer wall and the inner wall of the neck of the bottle;

an upper part, fixed to said central stem (4), said upper part including a cap part (9) comprising an abutment surface for abutting against the upper edge of the bottle when said stopper part is in an inserted position in which said central stem (4) is disposed inside the neck of the bottle; and

an outer part, depending from said upper part and arranged to embrace the outer surface of the neck of the bottle when said stopper part is in the inserted position, said outer part having a lower end portion comprising a widening arranged to fit into the outer recess (8) of the neck of the bottle when said stopper part is in said inserted position; and

a ring part (6) attached to said stopper part by frangible connection means (7) disposed between a lower portion of said ring part and an upper portion of said stopper part, said ring part having an inner diameter such that, once said stopper part is in the inserted position and once said frangible connection means is broken, said ring part is displaceable in a first direction to a closed position in which said ring part surrounds and embraces the outer part of said stopper part, said ring part having a lower inner flange (2) disposed below the lower end portion of said outer part of said stopper part in the closed position, in order to block said ring part so as to prevent accidental displacement of said ring part from the closed position.

5,813,555

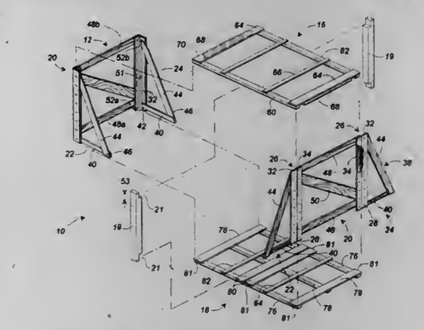
WING-END CLEATED CRATE

John M. Grigsby, Sr., Marietta, Ga., assignor to North American Container Corporation, Mableton, Ga.

Filed Nov. 17, 1995, Ser. No. 560,463

Int. Cl.[6] B65D *6/18;6/24;85/68*

U.S. Cl. 217—38 **8 Claims**



1. A cleated crate having wing-ends, comprising:

a base frame for supporting an article to be packed in a cleated crate;

a pair of wing-end frames, each wing-end frame comprising:

two hinge corners, each comprising:

a plate having a score along an axis thereof;

a pair of cleats attached to the plate and spaced-apart from the score to define a gap between the cleats;

the plate for folding on the score as a hinge to dispose the cleats at intersecting planes relative to each other; and

a side frame comprising:

at least one side member rigidly attached at one end to a first one of the pair of cleats and extending laterally thereof; and

a support member extending diagonally between said first one of the pair of cleats and a distal end of the side member;

a pair of parallel elongated members interconnecting the two hinge corners, whereby the two hinge corners are spaced-apart for defining corner posts on opposing sides of the cleated crate, the members rigidly joined at distal ends to respective second ones of the pair of cleats on the hinged corners; and

an end support member attached to and extending diagonally between the second ones of the pair of cleats on the two spaced-apart hinge corners,

whereby the wing-end frames lay flat for shipment and form opposing sides and end portions of the cleated crate by folding the hinge corners on their respective scores in a first direction for connection of the wing-end frames to the base frame of the cleated crate; and

a top frame dimensioned for receipt by the pair of wing-end frames on opposing ends of the cleated crate.

5,813,556

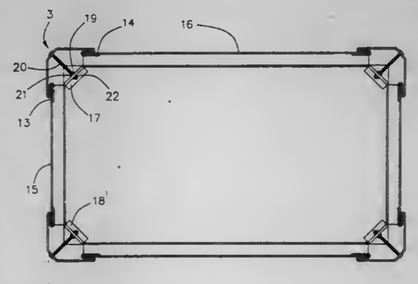
CASING SYSTEM FOR A TANK

Donald R. Onken, Easton, Ill., assignor to Onken's LLC, Easton, Ill.

Filed Feb. 13, 1997, Ser. No. 799,863

Int. Cl.[6] B65D *6/12*

U.S. Cl. 220—4.33 **8 Claims**



1. A novel system for joining exterior sheathing panels opposite each side of a tank to improve an appearance of the tank which comprises an elongated corner bracket having sides which are substantially at an angle of about 90° to each other, each side of said corner bracket has a S-shaped terminal end along the length thereof, each said S-shaped terminal end including a pocket (11, 12) along the length thereof, a supporting bracket secured to an upper wall at each corner of said tank near the corner and at a same angle relative to adjacent sides of said tank and means for securing an elongated corner bracket to said supporting bracket at each corner of said tank whereby said sheathing panels can be slid into said pockets 11, 12 of said corner brackets to enclose said tank with said sheathing panels spaced from said sides of said tank.

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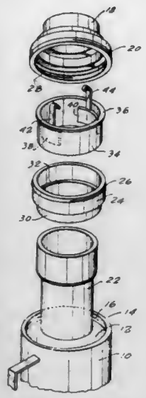
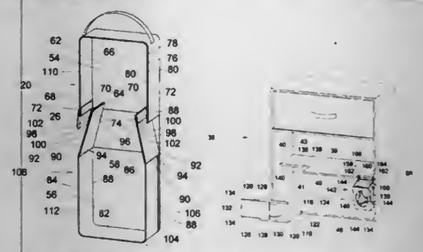
5,813,557
MAGNETIZED FLUID VESSEL
Ben Oratz, 79 Albertson Ave., Albertson, N.Y. 11507
Continuation of Ser. No. 621,467, Mar. 25, 1996, abandoned, which is a division of Ser. No. 364,806, Dec. 27, 1994, Pat. No. 5,542,562. This application May 16, 1997, Ser. No. 857,771
Int. Cl.[6] B65D *81/24*
U.S. Cl. 220—23.9 **7 Claims**



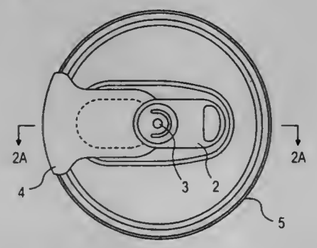
1. A fluid containing vessel comprising a non-metallic cup with an exterior wall, magnetic means having a portion with a negative magnetic polarity and means for mounting said magnetic means proximate said exterior cup wall with said negative polarity portion facing the cup and the fluid situated proximate said magnetic means, a metallic collar encircling said magnetic means and an enclosure adapted to receive said cup and said magnetic means.

5,813,558
BABY SUPPLIES CASE AND BAG/BASSINET COMBINATION
Linda M. Burke, 361 Cherry Pl., East Meadow, N.Y. 11554
Filed Jun. 17, 1997, Ser. No. 877,432
Int. Cl.[6] B65D *69/00;* **A45C** *9/00;* **A47C** *17/82;* **A47D** *7/00*
U.S. Cl. 220—23.83 **14 Claims**



1. An apparatus for holding and dispensing baby supplies, said apparatus comprising:
(a) a compartment for holding diapers, said compartment having two side walls, a bottom wall and a back wall;
(b) a container having an interior for holding baby wipes connected to said compartment for holding diapers;
(c) at least one holder for a container of baby powder or ointment movably connected to said compartment for holding diapers, said holder comprising:
(i) a first set of two opposing vertical panels, each of said panels having an upper edge, a lower edge, and two side edges, said panels having openings therein;
(ii) a second set of two opposing vertical panels, each of said panels having an upper edge, a lower edge, and two side edges, said panels having openings therein, said second set of two opposing vertical panels being connected at their side edges to the side edges of the panels of the first set of two opposing vertical panels, so as to form the four vertical walls of a hollow rectangular container;
(iii) a bottom panel fixedly connected to the lower edges of the panels in each of the two sets of opposing vertical panels, said bottom panel having an opening therein;
said two sets of opposing vertical panels and said bottom panel forming the four walls and bottom of a hollow rectangular container.

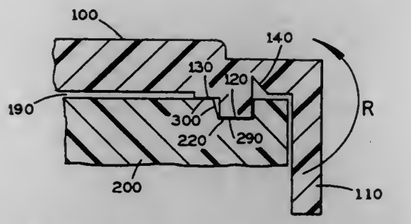
5,813,559
BEVERAGE CAN WITH SANITARY COVER
Sung Ho Cho, 517-17 AnYang 6th-dong, AnYang-City Kyeongki-Province, Rep. of Korea
Filed Nov. 27, 1996, Ser. No. 757,918
Claims priority, application Rep. of Korea, Nov. 28, 1995, 1995-44065
Int. Cl.[6] B65D *51/22*
U.S. Cl. 220—258 **7 Claims**



1. A beverage can comprising a lever opener attached on the top of the can by a rivet, and an opening cover to be selectively levered down by said lever opener in order to open the can, further comprising:
sanitary cover means normally covering a rim's lip portion nearest the opening cover and thereby preventing the lip portion from being contaminated during storage of the can, said sanitary cover means being rotatably attached on the top of said can by the rivet at a portion between said lever opener and the top of the can and being wide enough to effectively cover the lip portion, and extending in order to pass over a rim of the can thus forming a rim cover part covering a part of said rim.

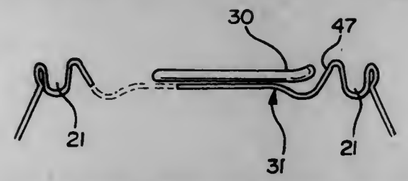
5,813,560
GAS CAP WITH BREAK-AWAY PORTION
David Weinberg, 5000 Oakes Rd., Suite H, Fort Lauderdale, Fla. 33304, and John Herzberg, 5205 Alton Rd., Miami Beach, Fla. 33140
Filed Apr. 25, 1997, Ser. No. 837,872
Int. Cl.[6] B65D *41/02*
U.S. Cl. 220—266 **8 Claims**

1. A gas filler cap having a premolded threaded base portion that is sealingly locked to a top lid portion, comprising:
a premolded top lid portion having a tab extending beneath a lower surface;
a premolded threaded base portion having a groove on an upper surface for mateably receiving the tab of the top lid portion;
a seal means between the tab and the groove for preventing gas fumes and fuel from leaking out therebetween;
the tab comprising an annular tab;



the lid including a step down inner edge radially inwardly of said annular tab; and
an indentation cutout on the lower surface of the lid portion between the tab and an exterior side wall of the lid portion, wherein the indentation cut-out provides a sacrificial breaking point upon impact and allows the exterior side wall of the top lid portion to break-off without breaking the seal means for reasons of safety upon impact.

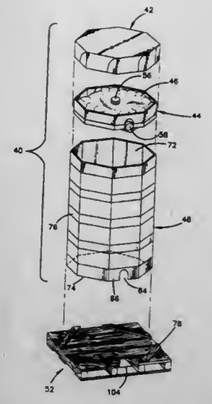
5,813,561
SANITARY BEVERAGE CAN LID
Charles Chang, and Lucy Chang, both of 55 Westview Rd., Wayne, N.J. 07470
Filed Feb. 28, 1997, Ser. No. 808,108
Int. Cl.[6] B65D *17/34*
U.S. Cl. 220—269 **11 Claims**



1. A flat end sanitary drinking container for liquids comprising:
a main body portion having a base and a hollow cylindrical wall portion extending outwardly therefrom at one end and a rim formed at the other end of said portion;
a lid having outer edges mounted to the rim and extending over the hollow cylindrical wall portion, a recessed portion adjacent the rim and a central portion extending upwardly from the recess a predetermined distance close to the rim, an aperture and a pull tab mounted on the central portion over the aperture wherein the extending central portion permits drinking from the aperture avoiding the recessed portion;
wherein the central portion includes an inner integral rim portion extending upwardly from the recess to prevent liquid from flowing into the narrow recess and having a slope extending inwardly towards the aperture to permit liquid to drain back into the aperture; and,
wherein the slope includes a large radius to facilitate cleaning and wherein the lid extends upwardly at the end of said slope forming a recess on the lid and wherein the tab extends outwardly over the recess for ease of opening.

5,813,562
FLUENT CONTAINER
David W. Perkins, Hiawatha, Iowa, assignor to Plastic Systems, Inc., Des Moines, Iowa
Filed Jun. 28, 1996, Ser. No. 672,404
Int. Cl.[6] B65D *90/04*
U.S. Cl. 220—495.05 **8 Claims**

1. Apparatus for containing a fluent material, comprising:
a fluent material containing bag with a discharge fitting;



a container having a bottom member forming a container bottom for said container, said bottom member having a bottom and a side flap bendably connected to the bottom, said bottom of said bottom member including a bendable tab, said container having a sidewall with a first opening disposed on the sidewall proximate the bottom member, said side flap including a second opening, said discharge fitting being received in said first and second openings, said container also having means for creating a discharge region beneath said container bottom, said container containing said bag so that said discharge fitting drains said bag from said discharge region; and
a pallet supporting said container without interfering with said discharge region creating means, said pallet including a V-notch proximate said bendable tab, such that when said bendable tab is bent into the V-notch a part of the discharge fitting is disposed in the discharge region which has a position lower than the bottom of the bottom member, so as to completely empty the fluent material in the bag.

5,813,563
CLOSURE HAVING EASY-OPEN PROMOTION COMPARTMENT
Ted W. Boehm, Crawfordsville; David E. Babcock, Lafayette; Hugh C. Urmston, Carmel; Daniel J. Denman, Crawfordsville, all of Ind., and Joseph M. Ladina, Marietta, Ga., assignors to Alcoa Closure Systems International, Inc., Crawfordsville, Ind.
Filed Nov. 15, 1996, Ser. No. 749,415
Int. Cl.[6] B65D *1/24*
U.S. Cl. 220—522 **12 Claims**

1. A promotional closure adapted for application to an associated container comprising:
a closure cap having a top wall portion and a depending annular skirt portion; and
a promotion-receiving member comprising a promotion compartment positionable generally beneath said top wall portion of said closure cap and inwardly of said annular skirt portion for disposition generally within said container,
said promotion compartment having a generally cup-shaped configuration, including a bottom wall, and an upstanding side wall extending upwardly therefrom,
said side wall comprising a frangible portion which can be opened by splitting said side wall after said closure is removed from said container and said promotion compartment is removed from within said closure sap, opening of said frangible portion facilitating removal of a promotional element from within said promotion compartment;
said frangible portion of said side wall comprises a side wall section and a pair of spaced apart preferentially weakened

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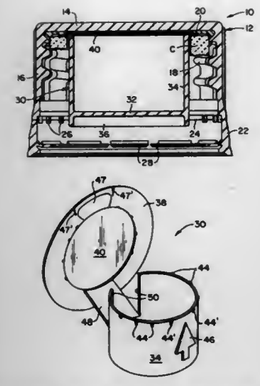
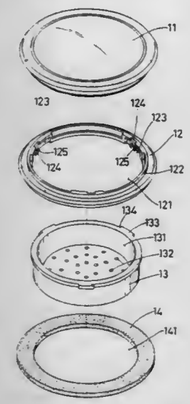


regions between which said side wall section is positioned, said promotion compartment including a finger grip connected to said side wall section for gripping said side wall section to facilitate fracture of said weakened regions.

5,813,564
COVER STRUCTURE FOR AN AIRTIGHT CONTAINER
Yi-Wen Luo, 58, Ma Yuan West St., Taichung, Taiwan
Filed Oct. 15, 1997, Ser. No. 951,053
Int. Cl.[6] B05D *81/26*
U.S. Cl. 220—522 **1 Claim**



1. A cover structure for an airtight container, comprising a top plate, a middle annular member, a desiccative box, and a silicone seal ring;

said top plate being a slightly convex round member and being formed at a bottom surface with a downward projected flange extending along an outer periphery of said top plate;

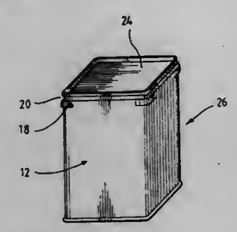
said middle annular member defining a central opening for said desiccative box to upward extend thereinto, an upward projected wall extending along a circumference of said central opening, a plurality of n-shaped guide ways being formed and equally spaced along an inner surface of said wall, a retaining block being provided in each said guide way near a lower middle point thereof, and a top right corner of each said retaining block forming a first bevelled guiding surface; whereby said middle annular member being engaged with said top plate by abutting an outer circumferential surface of said upward projected wall on an inner circumferential surface of said bottom flange of said top plate;

said desiccative box being an upward open container defining a round inner space for positioning desiccative packages therein, a plurality of equally spaced vents being formed on a bottom surface of said box, a plurality of radially outward projections being formed along an upper outer periphery of said box corresponding to said guide ways on said middle annular member, a top left corner of each said projection forming a second bevelled guiding surface;

whereby said desiccative box is detachably assembled to said middle annular member by engaging said projections into said guide ways on said middle annular member while positioning said projections above said retaining blocks in said guide ways; and

said silicone seal ring being an elastic annular member defining a central opening for a lower portion of said desiccative box to extend through, and said silicone seal ring being put beneath said middle annular member and around said desiccative box.

5,813,565
PROCESS FOR THE PRODUCTION OF METALLIC PACKAGING OF GENERALLY PRISMATIC SHAPE AND PACKAGING OBTAINED BY THIS PROCESS
Gerald Huot, Verneuil-sur-Avre, France, assignor to Safet Embamet, Villeneuve-La-Garenne, France
Filed Feb. 5, 1996, Ser. No. 596,659
Claims priority, application France, Feb. 3, 1995, 95 01292
Int. Cl.[6] B21D *6/28;* **B65D** *6/38;11/10*
U.S. Cl. 220—619 **18 Claims**



1. A metal package, comprising:

a tubular metal body (10) of substantially polygonal cross-section with lateral faces (12) which are connected together by rounded corners (14),

a necked end with a flange extending therefrom,

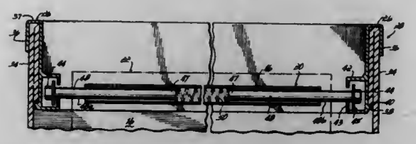
a metal-expansion bead (18) in proximity to the necked end in each of the corners (14) of the body, each bead being substantially the same distance from the necked end, each bead offsetting a surplus of metal at corresponding corners of the flange caused by formation of the neck,

said metal-expansion beads being spaced apart such that a discontinuity exists between each bead; and

a face (24) forming a top or bottom of the package seamed onto the necked end.

5,813,566
DAMAGE RESISTANT CONTAINER AND SLEEVE PACK ASSEMBLY
Judson A. Bradford, Holland; Donald J. Bazany, Grand Haven, and Bruce H. Landheer, Jenison, all of Mich., assignors to Bradford Company, Holland, Mich.
Filed Jul. 12, 1995, Ser. No. 501,613
Int. Cl.[6] B65D *81/00*
U.S. Cl. 220—653 **21 Claims**

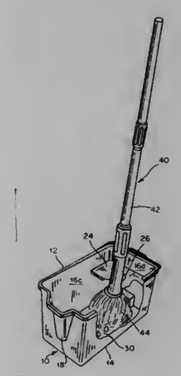
1. A sleeve pack for storing and shipping products comprising:



a body for containing products having a top, a bottom and opposing sidewalls, the sidewalls of the body being generally flexible to provide an amount of give under a force applied thereto;

a telescoping support bar positioned in the body and spanning between the opposing sidewalls for suspending products in the body, the ends of the support bar operably coupled to the sidewalls for moving with the sidewalls to create a means for telescoping the support bar in length when the sidewalls flex inwardly and outwardly when force is applied thereto and further to create said means for telescoping the support bar generally to its original length when the force is removed and the sidewalls are returned to their original shape.

5,813,567
MOP BUCKET HAVING INTEGRAL MOP STABILIZING STRUCTURE
Joy Mangano, 49 Suhill Rd., Nesconset, N.Y. 11767
Filed Nov. 12, 1996, Ser. No. 746,504
Int. Cl.[6] B65D *25/28*
U.S. Cl. 220—735 **8 Claims**



1. A mop bucket, comprising:

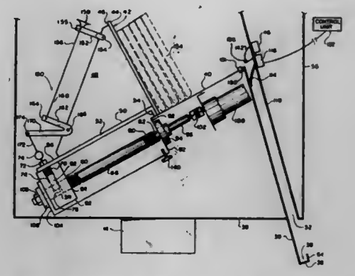
a) an upper lip;

b) a lower base having an anti-skid structure on an inner surface of said base for engaging a mop head, said anti-skid structure comprising a plurality of raised protrusions;

c) at least one side wall between said upper lip and said lower base and defining a container; and

d) a mop handle support member extending inward from said at least one side wall and having a notched end for engaging a mop handle, said support member being located above said base and below said lip.

5,813,568
DISPENSING MACHINE FOR NEWSPAPERS AND MAGAZINES
C. Rankin Lowing, Mobile, Ala., assignor to DPC International, Inc., Dublin, Ireland
Filed Mar. 29, 1996, Ser. No. 623,998
Int. Cl.[6] G07F *11/00*
U.S. Cl. 221—6 **11 Claims**



1. A vending apparatus for dispensing a single copy of a media unit, comprising:

a platform plate having an upper surface for supporting a plurality of media units;

a support plate slidably movable along said platform plate, said support plate retaining said media units in an upright position;

a driving means operationally connected to said support plate for advancing said support plate along said platform plate;

a dispensing channel formed adjacent a forward edge of said platform plate;

a means mounted on said platform plate for separating a single forward copy of said media unit prior to movement of the single copy into the dispensing channel, said separating means comprising at least one metering break having an upwardly inclined upper surface extending above said platform plate a distance from said forward edge of the platform plate, said at least one metering break causing compression of an edge of the forward copy of said media unit contacting said inclined upper surface as the forward copy of the media unit is advanced along said platform plate;

a sensor means mounted in an uppermost end of said dispensing channel for detecting movement of the single copy of the media unit into the dispensing channel, said sensor means transmitting a signal to said driving means to terminate advancement of said support plate when the single copy of the media unit drops into the dispensing channel.

5,813,569
POINT-OF-SALE MERCHANDISER
Lawrence Cihanek, Wappinger, N.Y., assignor to Elite Licensing Inc., Pleasantville, N.Y.
Filed Mar. 12, 1996, Ser. No. 614,304
Int. Cl.[6] B65D *83/00*
U.S. Cl. 221—150 R **20 Claims**

1. A point-of-sale merchandiser for merchandising a plurality of products, comprising:

a housing having a first end and a second end, said housing defining an interior chamber and having an opening in said second end thereof for communication with said chamber;

a dispensing rack disposed in said chamber and having a first end adjacent said first end of said housing and a second end adjacent said second end of said housing, said dispensing rack including:

at least one base plate dimensioned to support a plurality of products stacked thereon;

biasing means for urging said base plate from a first position near said first end of said dispensing rack to a second position near said second end of said dispensing rack; and

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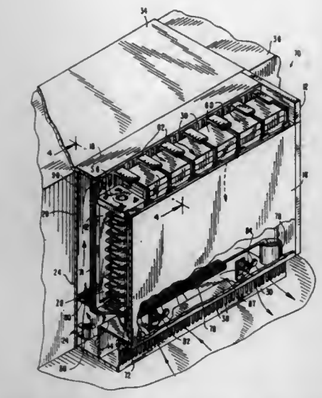


guide means for guiding said plurality of products stacked on said base plate for movement relative to said housing along a substantially linear path as said base plate moves from its first position to its second position such that said products are sequentially accessible through said opening in said second end of said housing;

a partition disposed in said interior chamber and spaced from a rear wall of said housing, said partition extending across said housing between side walls thereof for defining an air plenum between said rear wall and said partition; and

means for cooling said interior chamber, wherein said cooling means comprises an evaporator disposed in said plenum.

5,813,570

APPARATUS FOR CONTROLLABLY DISCHARGING FLOWABLE MEDIA

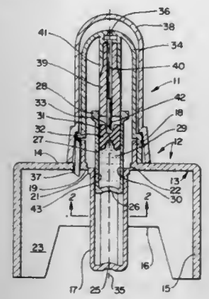
Karl-Heinz Fuchs, and Stefan Ritsche, both of Radolfzell, Germany, assignors to Ing. Erich Pfeiffer GmbH, Germany

Continuation-in-part of Ser. No. 571,942, Oct. 8, 1996, abandoned. This application Jan. 30, 1996, Ser. No. 594,055

Claims priority, application Germany, Apr. 8, 1994, 44 12 041.9; Jan. 23, 1996, 296 01 047.2 U

Int. Cl.[6] B67D *5/00*

U.S. Cl. 222—82 **24 Claims**



1. Discharge apparatus for flowable media, comprising:

a basic body, at least partly receiving a pump unit;

said pump unit having a pump chamber connectable to a discharge opening via a discharge channel;

a pump cylinder and a pump piston bounding said pump chamber;

said pump cylinder forming a medium reservoir;

said pump piston being displaceably guided in said pump cylinder for discharging all said medium contained in said medium reservoir by a single pump stroke in a pump stroke direction; and,

at least one breakable material bridge between said pump unit and said basic body which can be destroyed by an actuating force exerted in said pump stroke direction,

whereby said medium is discharged from said apparatus with a predetermined discharging pressure by a predetermined actuating force level and said apparatus is provided with a destroyable tamper-evident closure.

5,813,571

DEVICE FOR PACKAGING A PRODUCT WITH A SUPPORT RING FOR A MANUAL PUMP FOR DISPENSING IN INDIVIDUAL METERED AMOUNTS

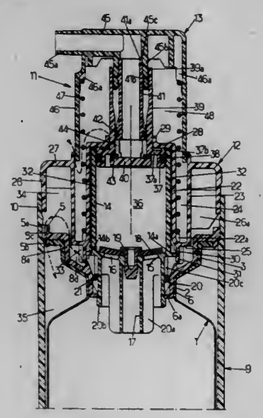
Denis Gaucher, Annecy, France, assignor to Societe d'Innovation Recherche Plastique, France

Filed Oct. 15, 1996, Ser. No. 730,186

Claims priority, application France, Oct. 19, 1995, 95 12300

Int. Cl.[6] B65D *35/28*

U.S. Cl. 222—95 **11 Claims**



1. A device for packaging and dispensing a product comprising:

a rigid outer container with an open neck,

a deformable inner container with an open neck, said inner container being essentially accommodated inside the outer container and intended to contain a product to be packaged and dispensed, and

a manual pump, of the type without air intake into the inner container, said pump being intended to dispense the product in individual metered amounts and being mounted in a leaktight manner on the neck of the inner container with the aid of leaktight means, wherein the pump includes a body having a tubular part which is surrounded by said leaktight means and is engaged in a leaktight manner in the neck of the inner container, for feeding the pump with product from the inner container, and the neck of the inner container is secured in a leaktight manner to a rigid annular ring, provided, at its outer periphery, with first fastening means, which interact with complementary fastening means of the neck of the outer container, for fastening the inner container and the ring on the outer container and, at its inner periphery, with second fastening means, which interact with complementary fastening means of the pump body, for fastening the pump to the ring, said tubular part of said pump body being engaged in said ring and said leaktight means comprising at least one annular gasket, mounted between said ring and said tubular part of the pump body while being separated from said second fastening means of the ring and from said complementary fastening means of said pump body.

5,813,572

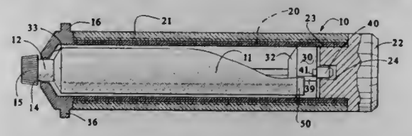
TOOTHPASTE DISPENSER

Ivo Kolacek, Berwyn, Ill., assignor to Liblan & Co., Inc., Wheeling, Ill.

Filed Aug. 28, 1996, Ser. No. 704,132

Int. Cl.[6] B65D *35/28*

U.S. Cl. 222—107 **20 Claims**



14. A dispenser comprising a tubular body for receiving a tube having a projection at one end with a discharge opening closed by a removable cap, said body having two ends with one end being closed by an end member having an opening for receiving the projection when the tube is inserted into the tubular body, said tubular body having two external projecting lugs adjacent the one end, means for forcing the contents of the tube out of the discharge opening of the tube, said means including a piston member received in the tubular body for movement therein and means for moving the member between a first position adjacent the other end of the two ends and a second position adjacent the one end to progressively flatten the tube to force the contents out of the discharge opening of the tube, said means for moving including two axially extending slots in the tubular body, a sleeve having a helical track formed by a thread received on the tubular body and rotatable relative thereto, and the piston member having two lugs projecting in opposite directions through the two slots and received in the helical track.

5,813,573

DISPENSER FOR THE SIMULTANEOUS DELIVERY OF AT LEAST TWO PASTE-LIKE PRODUCTS

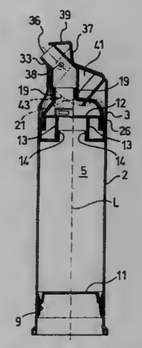
Piero Battegazzore, Alessandria, Italy, assignor to Guala S.p.A., Alessahdria, Italy

Filed Jun. 12, 1996, Ser. No. 661,971

Claims priority, application European Pat. Off., Jun. 28, 1995, 95830269

Int. Cl.[6] B67D *5/72*

U.S. Cl. 222—135 **4 Claims**



1. A dispenser for the simultaneous delivery of at least two paste-like products, comprising:

a container having a head and being formed internally from two separate cylindrical chambers which are side by side parallel to their longitudinal axes, each chamber being open towards the head and having an associated end wall sealingly slidable within it towards the head,

a resilient pumping member positioned under the head,

a tubular sleeve with a free end the opposite end being fixed to the pumping member,

an operating lever for pressing and releasing the pumping member, the said lever being pivoted about an axis which is fixed with respect to the container positioned perpendicular to the longitudinal axis of the said cylindrical chambers and turnable about the said axis from a resting position to a paste delivery position and vice versa,

a delivery duct containing two channels separated by a dividing partition having an inlet attached to the said free end of the sleeve and an outlet positioned at the head leading to the exterior thereof, the said operating lever having means for engagement with the said pumping member,

at least one transverse cover element for attaching the open end of the said adjacent chambers of the container, the said element having a respective aperture corresponding to each cylindrical chamber and attachment means aligned with the dividing partition of the said delivery duct,

a resiliently flexible dome-shape membrane in said pumping member for each of the cylindrical chambers of the container with the concave part facing towards them,

a diametric dividing partition in said tubular sleeve axially connected on one side to the dividing partition of the said delivery duct and, on the other side, to the said attachment means of the said transverse element, thereby subdividing the sleeve into two separate ducts which lie side by side in alignment with those of the delivery duct,

a pair of flexible flaps which are bent at their free ends over a respective underlying aperture of the transverse element, constituting first unidirectional valves, further unidirectional valve members being provided at the inlet of the delivery duct for each of its channels.

5,813,574

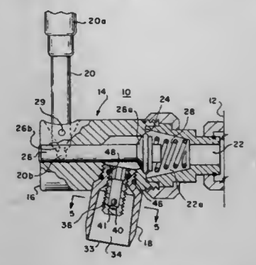
FROZEN BEVERAGE DISPENSING APPARATUS

Rex P. McNabb, P.O. Box 460879, Garland, Tex. 75046

Filed Oct. 18, 1996, Ser. No. 731,758

Int. Cl.[6] B67D *5/62*

U.S. Cl. 222—146.6 **20 Claims**



1. In an apparatus for dispensing material in at least a partially frozen state, said apparatus having a container for storing the material under pressure; a valve mounted with said container for controlling the dispensing of the material, said valve having a valve body with a bore communicating with an interior of said container; closure means disposed in said bore and being adapted to close said bore to prevent the material from passing therethrough when said closure means is in a first position; actuating means for moving said closure means to a second position wherein material is allowed to pass through said bore; and a conduit depending from said valve body, said conduit having an internal

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passageway through which the material is dispensed when said closure means is in said second position, wherein the improvement comprises:

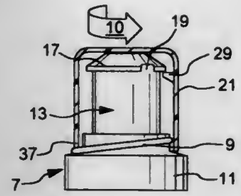
diffusion means for diffusing the material generally outwardly from a central longitudinal axis of said passageway and upwardly within said passageway, said diffusion means including a diffusion member located in said passageway and having an open top, a closed bottom and at least one wall extending between said top and said bottom, said at least one wall defining a chamber within said diffusion member, said chamber communicating with said bore through said open top, whereby material flows under pressure into said chamber when said closure means is in said second position, said diffusion member having an interior bottom surface which is sloped upwardly toward said at least one wall and said at least one wall having at least one port extending outwardly and upwardly through said at least one wall from said chamber to said passageway, whereby material flowing under pressure into said chamber when said closure means is in said second position is directed outwardly and upwardly within said passageway.

5,813,575

TOUCH FREE PUSH—PULL VALVE WITH OVERCAP

Kenneth P. Glynn, Township of Flemington, County of Hunterdon, N.J., and Stuart DeJonge, Township of Easton, County Northampton, Pa., assignors to Ideal Ideas, Inc., Flemington, N.J.

Filed Dec. 23, 1996, Ser. No. 773,317
Int. Cl.[6] B67D *3/00*
U.S. Cl. 222—182 **18 Claims**



1. A push-pull dispensing cap for a container having an open-necked top, said dispensing cap and said container being adapted for connection to one another, which comprises:

(a) a first cap member having means for direct attachment to an open-necked container and having outside threading for engagement with threading of an overcap, and having an upwardly projecting hollow portion with at least one dispensing port and having means for slideably attaching a second cap member thereon such that said second cap member having a dispensing port may be cyclically moved upwardly and downwardly, with a first, closed position being a downward, closed position for non-dispensing, and a second, open position being an upward, open position for dispensing;

(b) said second cap member having an outwardly projecting ridge thereon with a cut-out located on said ridge to permit passage therethrough of a protrusion located inside an overcap, said second cap member being attached to said first cap member with means to prevent full horizontal rotation of said second cap member relative to said first cap member; and,

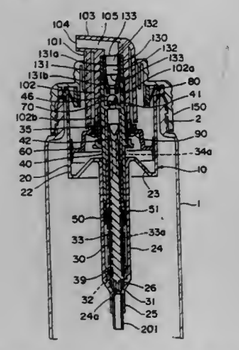
(c) said overcap hollow and adapted to fit over said second cap member and having a top and a sidewall, and having internal threading adapted to thread with said outside threading of said first cap member, and having an internal protrusion on the inside of said sidewall of said overcap, said internal protrusion, said overcap threading and said first cap member threading being aligned relative to said cut-out of said second cap member, such that when said second cap member is in said first, closed position, said overcap may be screwed onto said threading of said first cap member whereby said protrusion will contact and flex past said ridge of said second cap member and will rest thereunder away from said cut-out of said second cap member, and such that when said second cap member is in said second, open position, said overcap may be screwed onto said threading of said first cap member, said protrusion pushes said second cap member from said second, open position to said first, closed position, and such that when said overcap is already screwed onto said threading of said first cap member and said second cap member is in said first, closed position and said overcap is unscrewed, said protrusion lifts said second cap member to said second, open position and then passes through said cut-out for removal.

5,813,576

CONTAINER WITH A PUMP THAT MIXES LIQUID AND AIR TO DISCHARGE BUBBLES

Shigeo Iizuka; Hiroshi Mizushima; Haruo Tsuchida, and Tadao Saito, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/02356, § 371 Date Jul. 1, 1996, § 102(e) Date Jul. 1, 1996, PCT Pub. No. WO96/15952, PCT Pub. Date May 30, 1996
PCT Filed Nov. 17, 1995, Ser. No. 666,574
Claims priority, application Japan, Nov. 17, 1994, 6-309550; Dec. 12, 1994, 6-332015; Feb. 24, 1995, 7-061876; Mar. 29, 1995, 7-098108; May 23, 1995, 7-149463; Oct. 23, 1995, 7-274462; Oct. 23, 1995, 7-274463; Oct. 27, 1995, 7-281046
Int. Cl.[6] B67D *5/58*
U.S. Cl. 222—190 **8 Claims**



1. A container with a pump for discharging bubbles, comprising:

a container body having a neck portion; and

a pump for discharging bubbles provided on the neck portion of the container body,

wherein the pump for discharging bubbles comprises:

(a) a cylinder for liquid in which a first piston slides;

(b) a cylinder for air in which a second piston slides;

(c) a pump head on which a nozzle is provided and which is connected to the first piston and the second piston so as to drive the both pistons;

(d) a vapor-liquid mixing chamber in which liquid delivered from the cylinder for liquid and air delivered from the cylinder for air are joined;

(e) a liquid discharge valve which can be brought into contact with and separated from a valve seat provided on a liquid entrance of the vapor-liquid mixing chamber;

(f) a bubbling member provided between the nozzle and the vapor-liquid mixing chamber; and

(g) a limitation member which is provided a predetermined distance from an upper part of the valve seat of the liquid discharge valve and limits the vertical-direction-maximum-

migration-length from the valve seat of the liquid discharge valve within the range of from 0.1 mm to 1.0 mm, and

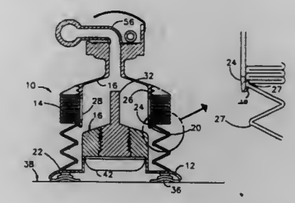
wherein when the pump head is depressed, liquid within the container body and air within the cylinder for air are joined in the vapor-liquid mixing chamber and the joined vapor-liquid is bubbled via the bubbling member to be discharged in a foamy state from the nozzle.

5,813,577

COLLAPSIBLE DISPENSER

Wan Ki Lee, 11722 Westshore Ct., Cupertino, Calif. 95014

Filed Sep. 18, 1996, Ser. No. 715,586
Int. Cl.[6] B65D *37/00*
U.S. Cl. 222—212 **26 Claims**



1. A collapsible dispenser, comprising:

storage means for storing material contents including a collapsible side wall and a tank base;

a top cap attached to said storage means for outputting the material contents from said storage means;

a shoulder connecting said storage means and said top cap, said shoulder including an inside shoulder;

hook means for catching a used-up portion of the collapsible side wall to be kept folded, said hook means extended from the inside shoulder; and

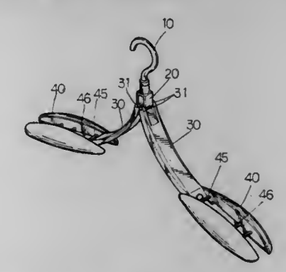
a bottom plug removable from the tank base of said storage means for refilling said storage means with the material contents.

5,813,578

FOLDABLE SUIT HANGER

Sing-Fuh Hsieh, P.O. Box 23-487, Changhua, Taiwan

Filed Dec. 11, 1997, Ser. No. 989,176
Claims priority, application Taiwan, Dec. 24, 1996, 85219993
Int. Cl.[6] A47G *25/40;25/14*
U.S. Cl. 223—94 **3 Claims**



1. A foldable suit hanger comprising:

a hooked body;

a retaining seat fastened at one end thereof with said hooked body and provided at another end thereof with two through holes;

two arms engaged respectively at one end thereof with said another end of said retaining seat; and

two side wings fastened pivotally and respectively at one end thereof with another end of said two arms;

wherein said two arms have a curvature and provided respectively at one end thereof with two lugs each having a through hole for fastening said arms with said retaining seat in conjunction with said through holes of said retaining seat and a pin, said arms further provided respectively at another end thereof with a through hole engageable with a pivot;

wherein said two side wings are composed of two wing bodies symmetrical to each other and similar in curvature to said arms, said side wings further composed of a locating rod and a plurality of connection rods holding said two wing bodies such that said two wing bodies are separated by a gap greater than a width of said arms, said two wing bodies provided respectively and correspondingly at one end thereof with a through hole for fastening pivotally said side wings with said arms in conjunction with said through holes of said another ends of said arms and said pivots, said wing bodies further provided respectively in an underside thereof with a recess;

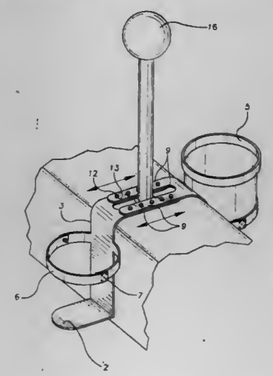
wherein said hooked body, said retaining seat, said arms, and said side wings can be folded to join together such that said retaining seat and said arm are located in said gap of said side wing, and that said hooked body is received in said recesses of said wing bodies of said side wing.

5,813,579

DUAL BEVERAGE HOLDER

Andrene Hendrickson, 3560 Swallow La., Decatur, Ga. 30032

Filed Sep. 11, 1997, Ser. No. 927,238
Int. Cl.[6] B60R *11/00*
U.S. Cl. 224—42.11 **6 Claims**



1. A dual beverage container holding device for mounting within the interior of a vehicle comprising:

first and second beverage holders each having a substantially L-shaped base member including a horizontal bottom support and a back support having a top end vertically depending therefrom;

each of said L-shaped base members further including first and second curved arms each extending from opposing sides of said back support, each of said curved arms having a distal end, for receiving and stabilizing a beverage container preventing displacement or lateral movement of said beverage container;

a flexible strap having two ends, a first end attached to an end of the first curved arm, a second end removably attached to an end of the opposing second curved arm forming a substantially circular receptacle for surrounding and securing a beverage container; and

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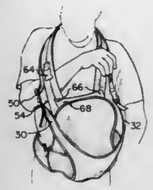
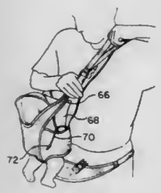
means for removably attaching the first beverage holder to the second beverage holder and for selectively adjusting the relative distance therebetween wherein said means includes a pair of spaced, substantially parallel tongues extending outwardly from the top end of each of said back supports.

5,813,580
SOFT-SIDED INFANT CARRIER CONVERTIBLE TO HIP CARRIER
Paul F. Fair, Denver, Colo., assignor to Lisco, Inc., Tampa, Fla.
Filed Oct. 25, 1996, Ser. No. 738,327
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—160 **8 Claims**





1. A method for converting a frameless infant carrier from a first position to a second position while in use on a body of an adult-sized wearer, the carrier including a pouch having a pair of shoulder straps, a pair of infant support straps, and a waistbelt attached thereto, the method comprising the steps of:

(a) disconnecting a first shoulder strap from the waistbelt;

(b) connecting the first shoulder strap to a corresponding first infant support strap;

(c) disconnecting a second shoulder strap from the waistbelt;

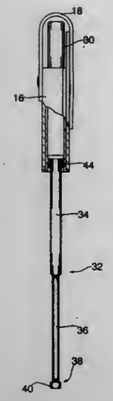
(d) connecting the second shoulder strap to a corresponding second infant support strap;

(e) slipping a first arm of the wearer under the first shoulder strap so that the first shoulder strap slips off a corresponding first shoulder of the wearer; and

(f) sliding the pouch laterally around the body of the wearer from the first position to the second position.

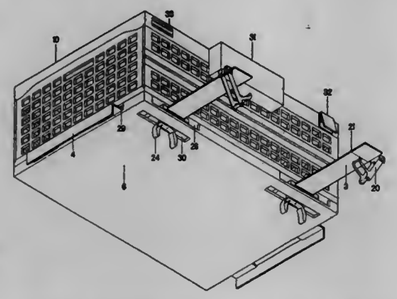
5,813,581
POUCH FOR THRUNCHEON
Albert Wilhelm Hellweg, Bayswater, Australia, assignor to Hellweg International Pty Ltd, Bayswater, Australia
Filed May 6, 1996, Ser. No. 642,906
Claims priority, application Australia, Sep. 1, 1995, PN5156
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—251 **2 Claims**

1. A pouch for a truncheon having a handle and a telescopically extendable shaft adapted to be retracted into the handle such that substantially all of the shaft is within the handle; the pouch having a cylindrical body with a hollow interior, an open upper end, and an open lower end; the open upper end being adapted to be closed at least in part by a flap so as to releasably retain the truncheon in the body; a hollow cylindrical insert with a lower flange portion



connected thereto, said insert mounted in the lower end of said cylindrical body with said flange portion pressing against the lower end of said body for supporting said handle permitting the shaft of the truncheon when in an extended position to pass therethrough and preventing the passage therethrough of the handle; flexible finger means comprising an L-shaped finger mounted within said insert adjacent the lower end adapted to engage and support a lower end of the shaft of the truncheon within the body when the truncheon is placed in the pouch in a retracted position so as to provide a seating surface for said shaft, said finger means being flexible and able to be deflected by the lower end of the shaft of the truncheon to enable the truncheon to be placed in and axially withdrawn from the pouch when the truncheon is in the extended position.

5,813,582
ADJUSTABLE SHOPPING BASKET FOR WHEELCHAIRS
Joi Henderson Wright, 4413 SE 33rd St., Amarillo, Tex. 79103
Filed Jan. 14, 1997, Ser. No. 783,622
Int. Cl.[6] A61G *5/10*
U.S. Cl. 224—407 **1 Claim**



1. An adjustable shopping basket adapted for use on wheelchairs with armrests, said basket comprising;

a collapsible container having a front, a rear and two sides; panels on the front and sides are collapsible to a horizontal state for storage or transport, and arranged vertically when in use, and

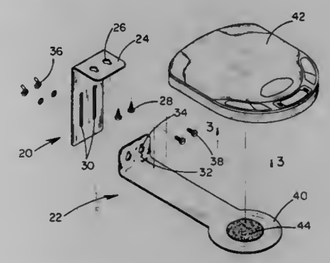
a base housing including support and adjustment means,

the support and adjustment means comprising a pair of sliding handle assemblies located in the base housing, each said sliding handle assembly being independently, linearly movable in a side to side direction, each said sliding handle assembly comprising a c-clamp extending through a slot in the base housing, said c-clamps adapted to attach to armrests of a wheelchair,

the support and adjustment means further comprising an elongated support bar slidably attached to each of the sliding handle assemblies, said support bars linearly movable in a front-to-rear direction, an end of each support bar at the rear of the basket hingedly supporting a spring-loaded clamp adapted to attach to an armrest of a wheelchair,

whereby the support and adjustment means allows side to side and front to back adjustment of the placement of the basket on a wheelchair, and the spring-loaded clamps and c-clamps allow secure attachment to the armrests.

5,813,583
PORTABLE CD HOLDER
Paulo Benedeti, 7519 La Paz Blvd., #407, Boca Raton, Fla. 33433
Filed Oct. 10, 1997, Ser. No. 947,514
Int. Cl.[6] B60R *11/02*
U.S. Cl. 224—483 **5 Claims**

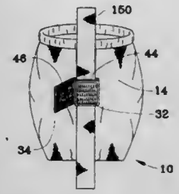


1. A new portable CD holder for holding a portable compact disc player for use in a motor vehicle comprising, in combination:

a bracket arrangement adapted for securement to an underside of a dashboard of a vehicle below a radio thereof, the bracket arrangement including an upper vertical component and a lower horizontal component, the upper vertical component having a tab portion extending inwardly from an upper end thereof, the tab portion having a pair of apertures therethrough, the tab portion positionable on the underside of the dashboard below the radio and receiving a pair of screws therethrough for securement to the underside of the dashboard, the upper vertical component having a pair of vertically disposed elongated slots therethrough, the lower horizontal component having a lower tab portion extending upwardly from an inner end thereof, the lower tab portion having a pair of apertures therethrough, the lower tab portion positionable against the upper vertical component with the pair of apertures aligning with the elongated slots for securement therewith by a pair of nuts and bolts, the lower horizontal component having a circular mounting pad extending outwardly from an outer end thereof, the circular mounting pad having a diameter less than that of a standard portable CD player; and

a pair of circular hook and loop patches, one of the hook and loop patches secured to the circular mounting pad, the other one of the hook and loop patches being securable to an underside of a portable CD player, the pair of hook and loop patches securing the portable CD player to the circular mounting pad.

5,813,584
STUFFED TOY CARRIER
Ann Carlisle McKay Mauser, Boynton Beach, Fla., assignor to Carlisle Showers, Inc., Boynton Beach, Fla.
Filed May 5, 1997, Ser. No. 851,228
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—605 **15 Claims**



1. A stuffed toy pouch comprising:

a pocket structure including a first panel joined to a second panel; said first panel having an upper edge, a first side edge, a second side edge, and a bottom edge, each of said first panel side edges extending between said first panel upper edge and said first panel bottom edge; said second panel having an upper edge, a first side edge, a second side edge, and a bottom edge, each of said second panel side edges extending between said second panel upper edge and said second panel bottom edge; said first and second side edges of said first panel joined to corresponding said first and second side edges of said second panel; said first panel bottom edge having a central portion joined to a central portion of said second panel bottom edge; and

a means for fastening said pocket structure to a strap, said means for fastening being a rectangular sheet of flexible material having a first and second side surface divided into three sections defining a centrally disposed backing section permanently secured to said first panel with a first and second overlapping section extending therefrom having a hook and pile securement between said overlapping sections;

whereby the coupling of said first panel to said second panel forms a pocket structure having an enlarged opening along said upper edges, a first leg opening, and a second leg opening, said leg openings located along opposite sides of said joined portions of said bottom edges, wherein said pocket structure allows insertion of a stuffed toy therein thereby forming a stuffed pocket structure, with a bead of the stuffed toy protruding from said enlarged opening, and with legs of the stuffed toy protruding from said leg openings, said means for fastening allowing said stuffed pocket structure to be secured to a strap.

5,813,585
DISPENSER FOR PLASTIC BAGS
Charles P. Kannankeril, North Caldwell, N.J.; Bruce A. Cruikshank, Wilton, Conn.; German Gavronsky, Stamford, Conn., and Brian K. Farison, New Milford, Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.
Continuation of Ser. No. 298,203, Aug. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 175,292, Dec. 29, 1993, Pat. No. 5,573,168. This application Apr. 10, 1997, Ser. No. 827,630
Int. Cl.[6] B26F *3/02*
U.S. Cl. 225—106 **13 Claims**

1. A dispensing apparatus or serially dispensing plastic bags from a wound roll of continuous flexible plastic bags joined along perforated severance lines, said dispensing apparatus comprising:

a container for receiving the wound roll of plastic bags, said container including a generally planar bottom, a pair of opposed sides extending upwardly from said bottom and a pair of inwardly facing generally planar flanges carried by and extending generally transversely of said sides and generally

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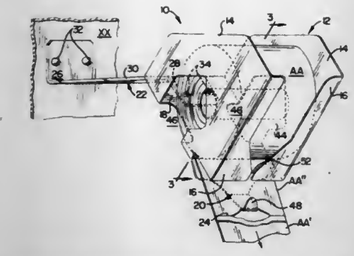


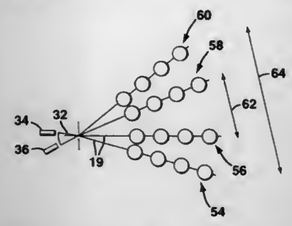
perpendicular to said bottom, said bottom, sides and flanges defining a dispensing opening for the plastic bags;

a separating tongue located on said container adjacent said dispensing opening for engaging a severance line of the plastic bags and separating the plastic bags from the wound roll;

self-threading means for threading an end bag from the wound roll received in said container onto said separating tongue, and said self-threading means comprising an upwardly opening and upwardly widening space between said flanges for receipt of an end bag of a wound roll upon insertion of the roll into the container and defining a predetermined guide path for the end bag downwardly into the dispensing opening; and

a mounting bracket having a first end for mounting said container to a solid surface and a second end for attaching to said container, so as to mount said container in a desired orientation for biasing the wound roll against said self-threading means and said bottom for self-braking of the wound roll and for reducing overspinning thereof as plastic bags are serially separated therefrom.

5,813,586
APPARATUS AND METHOD FOR CONTROLLING WEB SPEED
Freddy Van den Steen, Serskamp; Eric M. De Smedt, Opwijk, and Wim Verbeke, Aalst, all of Belgium, assignors to FMC Corporation, Chicago, Ill.
Continuation of Ser. No. 560,425, Nov. 17, 1995, abandoned.
This application Jul. 28, 1997, Ser. No. 901,823
Int. Cl.[6] B65H *20/00;* **B23Q** *15/00*
U.S. Cl. 226—8 **18 Claims**



1. An apparatus for controlling the speed of a web of film for producing bags comprising:

nip rolls for feeding said web;

a dancer having a dancer arm for receiving said web, said dancer arm operating between an upward and downward position, said nip rolls feeding said web to said dancer;

a sensor for sensing a position of said dancer arm;

draw rolls for drawing said web, said web being provided from said dancer to said draw rolls;

means for temporarily stopping the flow of said web at said draw rolls, said means for temporarily stopping defining a cycle interrupt for a duration when said web is temporarily stopped;

means for providing said nip rolls with a fixed speed once said cycle interrupt occurs; and

means for providing said nip rolls with a variable speed once said sensor senses that said dancer arm reaches said upward position.

5,813,587
LAMINATING MACHINE REGISTER-LENGTH AND WEB TENSION CONTROLLER
Richard Eric Nordgren, Daleville, Va., assignor to Westvaco Corporation, New York, N.Y.
Continuation of Ser. No. 538,350, Oct. 3, 1995. This application Jan. 27, 1997, Ser. No. 788,846
Int. Cl.[6] B65H *23/04;23/18;* **G05B** *13/02*
U.S. Cl. 226—29 **2 Claims**

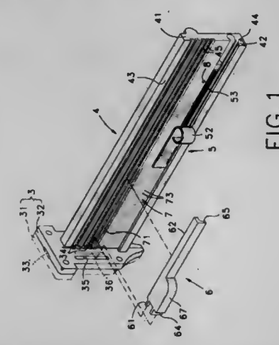


FIG. 1

1. A paperboard laminating machine register-length controller, wherein said controller is comprised of:

a first summer;

a Smith-Predictor loop operatively connected to said first summer;

a paperboard laminating machine operatively connected to said Smith-Predictor loop wherein said Smith-Predictor loop is further comprised of:

a laminator rewind register-length measurer located within said laminating machine;

a first filter operatively connected to said laminator rewind register-length measurer and said first summer; and

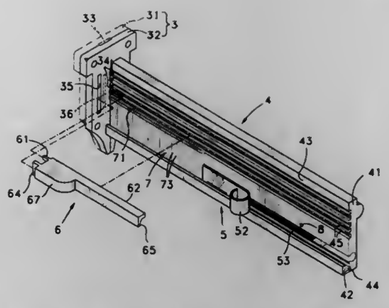
a Smith-Predictor operatively connected to said first summer; and

a PID loop operatively connected to said laminating machine and said Smith-Predictor loop.

5,813,588
MAGAZINE ASSEMBLY FOR FASTENER DRIVING TOOLS
George Lin, P.O. Box 10780, Taipei, Taiwan
Filed Oct. 28, 1997, Ser. No. 959,178
Claims priority, application Taiwan, Oct. 9, 1996, 85112383
Int. Cl.[6] B25C *5/16;1/04*
U.S. Cl. 227—109 **18 Claims**

10. A magazine assembly mounted to a fastener driving tool for supporting a row of fasteners, defined by three parts which are tips, shanks, and head portions, to be pushed along a guide track of a nose of said fastener driving tool and then into a driver track of said fastener driving tool; said nose being provided with a first nose element and a second nose element; said magazine assembly comprising:

a longitudinal track element having a base with a slide groove in section for supporting said tips of said fasteners which may

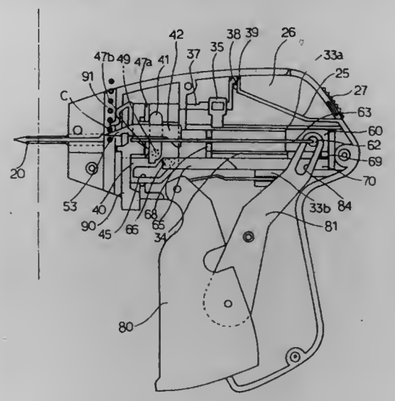


freely slide therein, and a side portion for supporting said shanks of said fasteners in said slide groove;

a longitudinal guide plate having an inner lateral end, an outer lateral end, and a front end, said inner lateral end being mounted at said side portion of said track element, said outer lateral end having a pendant for restricting an outer edge of said head portions of said fasteners, and said front end of said guide plate being inserted into said guide track in a contiguous relationship with said driver track and being mounted at said nose of said fastener driving tool such that said guide plate may be firmly secured and run parallel to said slide groove for restricting said head portions of said fasteners; and

a fastener pusher device being able to move along said slide groove and push said fasteners towards said nose.

5,813,589
TAG PIN ATTACHER
Choon-Sun Kim, 999-10, Shinjung 4-Dong-Yangchon-Gu, Seoul, Rep. of Korea
Division of Ser. No. 527,578, Sep. 13, 1995, Pat. No. 5,639,006. This application Feb. 12, 1997, Ser. No. 798,909
Int. Cl.[6] B65C *7/00*
U.S. Cl. 227—67 **2 Claims**



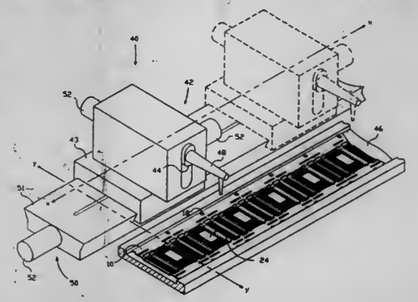
1. A tag pin attacher comprising:

an interconnector (**61**) having a yoke (**68**) and slider (**60**) slidably disposed therein, the slider (**60**) being interconnected to a lever (**81**);

a casing (**2**) having upper and lower horizontal walls (**33***a* **33***b*) formed therein, the slider (**60**) being slidably disposed between the upper and lower horizontal walls (**33***a* **33***b*); and

a latch (**35**) sliding on a bar (**37**) disposed adjacent to and in front of the upper horizontal wall (**33***a*), the latch (**35**) being interconnected to a knob (**361**) disposed out of the casing (**2**) and protruding between the upper horizontal wall (**33***a*) and the yoke (**68**) of the interconnector (**61**) for adjusting a stroke of the slider (**60**) within the interconnector (**61**) thereby.

5,813,590
EXTENDED TRAVEL WIRE BONDING MACHINE
Rich Fogal, and Michael B. Ball, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Dec. 18, 1995, Ser. No. 574,156
Int. Cl.[6] H01L *21/60*
U.S. Cl. 228—4.5 **9 Claims**



1. A wire bonding machine, comprising:

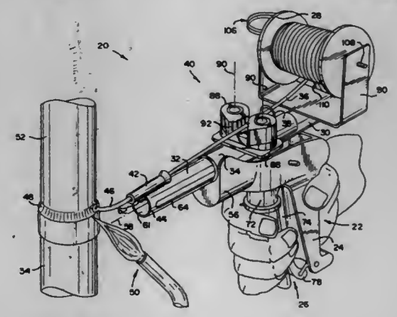
a. a first positioning table having a first range of motion, the first positioning table movable along an X axis in a first horizontal plane;

b. a second positioning table having a second range of motion, the second positioning movable along X and Y axes in a second horizontal plane and the second positioning table being supported on the first positioning table;

c. a bond head supported on the second positioning table; and

d. the first range of motion is 3 to 6 times greater than the second range of motion.

5,813,591
SOLDER FEEDER
David L. Quinn, 3506 Meadow La., and Kevin M. Quinn, 2606 Fontana Dr., both of Glenview, Ill. 60025
Filed Dec. 6, 1996, Ser. No. 761,445
Int. Cl.[6] B23K *3/06*
U.S. Cl. 228—41 **14 Claims**



1. A solder dispenser comprising:

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a body having a handle thereon for holding said solder dispenser;

a sleeve on said body having a central axis extending therethrough;

a shuttle positioned in said sleeve for movement along said central axis, said shuttle having a front end and a trailing end;

a trigger assembly carried on said body and attached to said shuttle for selectively displacing said shuttle along said central axis;

a solder holder attached to said trailing end of said shuttle for retaining a spool of solder thereon;

a guide attached to said front end of said shuttle distal said solder holder;

a solder gripper for selectively gripping a portion of solder positioned therein, said solder gripper being attached to said body between said solder holder and said guide for resisting rearward motion of said solder position therein upon rearward motion of said shuttle along said central axis for extending a length of solder from said spool, said solder gripper allowing said extended length of solder to pass therethrough when said shuttle moves in a forward direction relative to said body to drive the extended solder through said guide for use in a soldering operation.

5,813,592

FRICTION STIR WELDING

Ole Terje Midling; Edward James Morley, both of Kopervik, and Anders Sandvik, Skjold, all of Norway, assignors to The Welding Institute, Cambridge, England

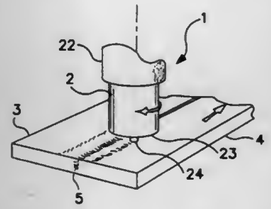
PCT No. PCT/NO95/00005, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/26254, PCT Pub. Date Oct. 5, 1995

PCT Filed Jan. 5, 1995, Ser. No. 718,590

Claims priority, application Norway, Mar. 28, 1994, 941144; Jul. 27, 1994, 942790

Int. Cl.[6] B23K *20/12*

U.S. Cl. 228—112.1 **18 Claims**



1. A method of friction stir welding of members, particularly for joining of extruded assembled shapes, comprising steps of urging and securing the assembled members towards each other, entering the assembled members along the joining line by a probe of material harder than the material of joined members under rotating movement which generates a frictional heat, thereby creating a plasticised region in the adjacent members' material, the method further comprising a homogenization of the resulting weld seam ensured by an enhanced flow of plasticised material both perpendicularly and vertically to the longitudinal extension of the adjacent assembled members by exposing the created plasticised material to a perpendicular pressure along the surface of the members and causing simultaneous material flow along the probe pin in the vertical direction allowing the plasticised material to solidify behind the probe.

5,813,593

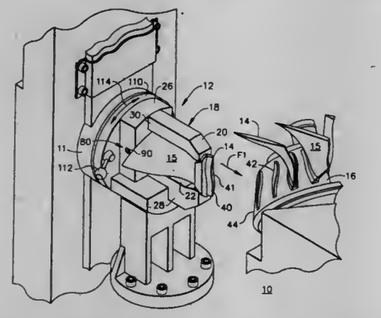
TRANSLATIONAL FRICTION WELDING APPARATUS AND METHOD

Lawrence J. Galaske, Jr., Hamilton, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 15, 1996, Ser. No. 749,685

Int. Cl.[6] B23K *20/12*

U.S. Cl. 228—112.1 **28 Claims**



1. An apparatus for translational friction welding of a first component to a second component, said apparatus comprising:

a holder to hold said first component within an open ended frame having an open space within for receiving said first component,

said frame having a base with transversely spaced apart first and second members which longitudinally extend from said base to an open end of said frame, and

located at said open end is a clamping means for using translational friction welding pressure to clamp said first component in said holder with clamping forces in directions along three orthogonal axis wherein the clamping forces are reaction forces due to translational friction welding pressure applied to said first component through said holder in a first direction to press said first component into contact with said second component during translational friction welding and wherein said first direction is substantially in direction along one of said three orthogonal directions.

5,813,594

APPARATUS FOR FORMING AN END BUMPER FOR VEHICLES

Peter Sturrus, Grand Haven, Mich., assignor to Shape Corporation, Grand Haven, Mich.

Continuation of Ser. No. 534,123, Sep. 26, 1995, Pat. No. 5,566,874, which is a continuation of Ser. No. 297,142, Aug. 29, 1994, Pat. No. 5,454,504, which is a division of Ser. No. 12,230, Feb. 2, 1993, which is a continuation of Ser. No. 499,100, Mar. 26, 1990, Pat. No. 5,306,058. This application Oct. 21, 1996, Ser. No. 734,353

Int. Cl.[6] B23K *31/02*

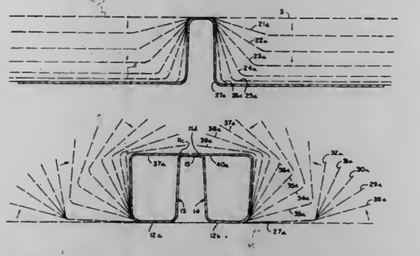
U.S. Cl. 228—146 **29 Claims**

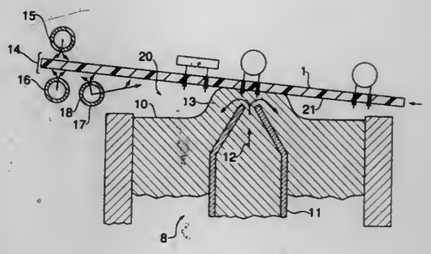
1. A method of forming bumper bars for vehicles comprising steps of:

providing an elongated sheet of high strength steel having a tensil strength of at least about 60 KSI;

continuously roll-forming the sheet of high strength steel with a roll-forming apparatus into an elongated linear shape with portions of the sheet engaging one another to form at least one closed tubular section, the elongated linear shape having a cross section shaped for beam strength, for impact resistance, and for vehicle aesthetics;

providing a welder located generally in-line with an end of the roll-forming apparatus;





by using the welder, welding the portions of the sheet together to permanently form the at least one closed tubular section as the elongated linear shape exits the roll-forming apparatus;

providing a sweeping mechanism including internal and external mandrels constructed to deform the elongated linear shape, and supporting the internal mandrel from a location upstream of the sweeping mechanism;

providing a driving mechanism proximate the sweeping mechanism having sufficient power to force the elongated linear shape including the at least one closed tubular section through the sweeping mechanism, the driving mechanism being located relatively close to the sweeping mechanism to minimize a distance therebetween;

by using the sweeping mechanism and the driving mechanism, continuously sweeping the elongated linear shape into an elongated curvilinear shape simultaneously with the step of continuously roll-forming the sheet;

maintaining the cross section during the step of sweeping by supporting the cross-section of the elongated linear shape at and also upstream of the sweeping mechanism, the supporting at the sweeping mechanism being provided by a downstream portion of the internal mandrel and by the external mandrel, and the supporting upstream of the sweeping mechanism being provided by an upstream portion of the internal mandrel and by an exterior holder located between the welder and the external mandrel, the upstream portion of the internal mandrel being located upstream from the downstream portion of the internal mandrel and extending sufficiently close to the driving mechanism to prevent undesired crushing and deformation of the cross section including the at least one closed tubular section; and

cutting segments from the elongated curvilinear shape to make bumper bars for vehicles.

5,813,595

METHOD FOR WAVE-SOLDERING PRINTED CIRCUIT BOARDS

Hans-Jürgen Albrecht, and Günter-Werner Strick, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE95/00441, § 371 Date Mar. 7, 1997, § 102(e) Date Mar. 7, 1997, PCT Pub. No. WO95/30509, PCT Pub. Date Nov. 16, 1995

PCT Filed Mar. 22, 1995, Ser. No. 737,183

Claims priority, application Germany, May 6, 1994, 44 16 788.1

Int. Cl.[6] H05K *3/34*

U.S. Cl. 228—200 **6 Claims**

1. A method for wave-soldering a printed circuit board, said printed circuit board including a solder resist mask thereon, comprising the steps of:

passing the printed circuit board through a solder wave to apply solder thereon;

artificially cooling the printed circuit board after passing it through the solder wave to cool the printed circuit board to room temperature to achieve differential contraction of the solder resist mask and of the solder applied onto the printed circuit board with an approximately constant temperature gradient of approximately 20 K/sec.

5,813,596

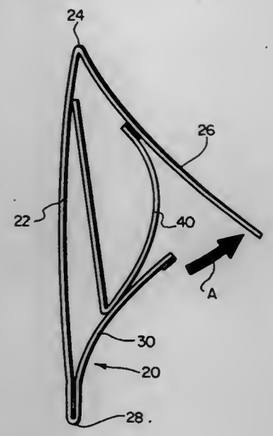
POP-UP ADVERTISING DEVICE AND METHOD

Ake L. Dahlquist, Dixon, Ill., assignor to Dixonweb Printing Company, Dixon, Ill.

Filed Jan. 23, 1996, Ser. No. 589,988

Int. Cl.[6] B65D *27/00*

U.S. Cl. 229—92.8 **17 Claims**



1. A mailing device comprising:

a first sheet having a first fold defining a point of intersection between a cover panel and a front panel, and a second fold defining a point of intersection between said front panel and a spring panel, said cover panel, front panel and spring panel each having an inner and an outer surface;

a pop-up insert having an attaching panel and a free panel which intersect at a third fold, said attaching panel and said free panel each having an inner and outer surface;

a portion of said outer surface of said attaching panel being attached to a portion of said inner surface of said cover panel; and

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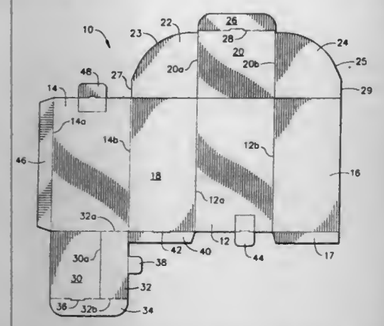
said inner surface of said attaching panel and said inner surface of said free panel being adjacent.

5,813,597
DUAL ORIENTATION DISPENSER CARTON
Gary T. Wakevainen, Loveland, Ohio, assignor to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio
Filed Oct. 15, 1996, Ser. No. 732,544
Int. Cl.[6] B65D *5/54;5/66*
U.S. Cl. 229—122.1 **8 Claims**



1. A container for holding and dispensing a plurality of medical items comprising:

a top panel;

a bottom panel;

a pair of opposed side panels connected between the top panel and the bottom panel;

a front panel detachably connected to at least one of the top panel, the bottom panel, or the opposed side panels; the front panel movable between an open position and a closed position for defining a first dispensing location, said front panel including a pair of curved side panels, said front panel serving as a bin-type opening;

a rear panel opposite the front panel and having at least one section which is detachably connected to at least one of the top panel, the bottom panel or the opposed side panels, the at least one section of the rear panel movable between an open position and a closed position for defining a second dispensing location, said at least one section of the rear panel having at least one perforation line for permitting said at least one section of the rear panel to be partially lifted and extended away from said rear panel by tearing along said at least one perforation line; and

a plurality of medical items contained within said panels.

5,813,598
THERMOSTAT DEVICE FOR PROTECTING AN ENGINE OF A VEHICLE FROM OVERHEATING
Yoon-Taek Kim, Kyungki-Do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea
Filed Oct. 25, 1996, Ser. No. 738,288
Int. Cl.[6] F01P *7/16*
U.S. Cl. 236—34.5 **7 Claims**

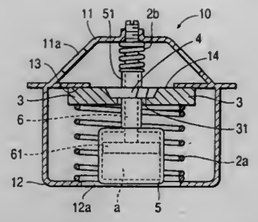
1. A thermostat, comprising:

housing having an inlet port and an outlet port;

a valve seat disposed in said housing and having an aperture therein;

a first valve for opening and closing said aperture;

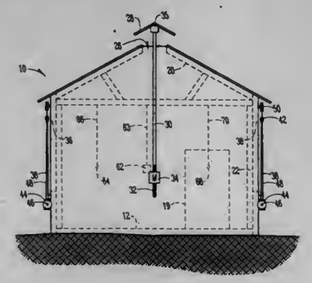
temperature sensing means for sensing a temperature of a fluid supplied to said inlet port, and for controlling an operation of said first valve based on said sensed temperature;



a second valve for opening and closing a portion of said aperture; and

pressure sensing means for sensing a pressure of said fluid supplied to said inlet port, and for controlling an operation of said second valve based on said sensed pressure relative to a threshold pressure, said pressure sensing means comprising means for biasing said second valve so as to close said portion of said aperture with a predetermined biasing force, wherein a force applied to said second valve by said fluid at a sensed pressure greater than said threshold pressure exceeds said predetermined biasing force, whereby said second valve moves to open said portion of said second aperture.

5,813,599
AUTOMATED CONTROLLER FOR NATURALLY VENTILATED LIVESTOCK AND POULTRY BUILDINGS
Steven J. Hoff, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Nov. 19, 1996, Ser. No. 752,333
Int. Cl.[6] F24F *11/00*
U.S. Cl. 236—49.3 **4 Claims**



4. A livestock building, comprising,

an elongated livestock compartment,

a plurality of closeable air openings on said structure connecting the air in said compartment to the air exterior to said compartment,

a controller having stored therein predetermined parameters of temperature,

sensor means in said building connected to said controller for measuring temperature within said building,

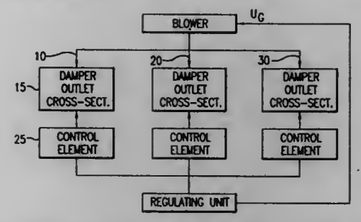
said controller adapted to compare the temperature conditions within said building to said parameters of temperature for the conditions of temperature sensed within said building;

said temperature sensors being located in separate groups of individual sensors;

said controller including means to average the temperatures in each group and comparing the average temperature in each group with said parameters of temperature;

said controller being operatively connected to said openings to increase or decrease the amount of air capable of moving through said openings to bring the conditions of temperature in said building within said predetermined parameters for temperature conditions inside said building wherein existing temperature in said building are outside of said parameters.

5,813,600
METHOD FOR OPERATING A HEATING AND/OR AIR CONDITIONING SYSTEM
Wolfgang Straub, Deggingen, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany
Filed Apr. 18, 1997, Ser. No. 840,916
Claims priority, application Germany, Apr. 18, 1996, 196 15 239.9
Int. Cl.[6] F24F *11/04*
U.S. Cl. 236—49.3 **4 Claims**

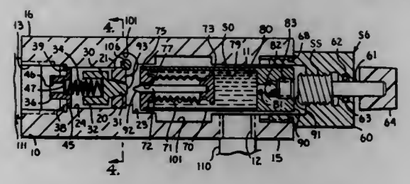


1. A method for operating at least one of a heating and air conditioning system of a motor vehicle in which a temperature control fluid is drawn in via a discharge blower having a regulatable discharge power, and is blown out again after being processed through at least one outlet duct having an outlet cross-section which is regulatable via a corresponding controllable control element, the method comprising the steps of:

automatically adjusting each control element to regulate an outlet cross-section so as to assume a position depending on a temperature of the temperature control fluid being blown out; and

adjusting the regulatable discharge power of the discharge blower via a characteristic curve (U_G) as a function of the temperature (T_L) of the temperature control fluid, said characteristic curve being dependent on the positions of each control element and on a total outlet cross-section (A_L) determined based on each control element such that a temperature control fluid outflow rate remains substantially constant.

5,813,601
TEMPERATURE RESPONSIVE FLOW CONTROL VALVE
Wayne A. Priest, Kansas City, and Philip M. Burger, Lenexa, both of Kans., assignors to Burger Engineering, Inc., Olathe, Kans.
Filed Jun. 12, 1997, Ser. No. 873,376
Int. Cl.[6] G05D *23/12*
U.S. Cl. 236—93 A **10 Claims**



7. A temperature responsive flow control valve comprising:

(a) a valve body having a fluid flow passageway extending therewithin; said fluid flow passageway connected proximate a first end to an inlet opening and proximate a second end to an outlet opening;

(b) a valve seat positioned within said fluid flow passageway of said valve body between said inlet opening and said outlet opening and having a valve seat opening extending therethrough;

(c) a valve head biasingly urged into seated engagement with said valve seat from an outlet side of said valve seat;

(d) an abutment member secured to said valve body and extending into said fluid flow passageway at said first end thereof; said abutment member being advanceable relative to said fluid flow passageway such that the distance between said valve head and said abutment member is adjustable;

(e) a thermally responsive actuator having a front end and a rear end and whose length increases as the actuator is heated; said actuator positioned within said fluid flow passageway between said valve head and said abutment member such that said front end of said actuator is positioned proximate said valve head and said rear end is positioned proximate said abutment member; said rear end of said actuator engaging said abutment member and said front end of said actuator engaging said valve head and advancing said valve head away from said valve seat as the temperature of said actuator exceeds the temperature at which the length of the actuator increases to correspond to the distance between the valve head and the abutment member;

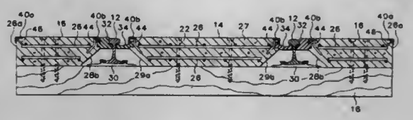
(f) said abutment member is threadingly secured within a plug which is secured across said fluid flow passageway at said first end of said valve body;

(g) said abutment member is connected to a knob by a shaft extending through said plug;

(h) temperature indicia is printed on an outer face of said plug radially relative to said knob and indicating the rotational orientation of the actuator at which the distance between the abutment member and the seated valve head approximately corresponds to the length of the actuator when the temperature of the actuator corresponds to the selected temperature indicia; and

(i) said valve head and said valve seat are shaped to form an incomplete seal when said valve head is seated relative to said valve seat such that at least a small amount of fluid is allowed to flow past the valve head at all times.

5,813,602
SECURING EDGE PROTECTORS FOR CONCRETE GRADE CROSSING PANELS HAVING INTEGRAL ELASTOMERIC SEALS
Bryan L. Holland, Tualatin, Oreg., assignor to Omni Products, Inc., Portland, Oreg.
Filed Jul. 3, 1997, Ser. No. 887,890
Int. Cl.[6] E01C *9/04*
U.S. Cl. 238—8 **20 Claims**



1. A railroad grade crossing for extending a roadway across a pair of parallel, spaced apart rails, comprising:

(a) at least one concrete panel having at least one longitudinal rail edge adjacent and parallel to at least one of said rails;

(b) at least one elastomeric seal parallel to said at least one longitudinal rail edge, said at least one seal positioned between one of said rails and said at least one longitudinal rail edge;

(c) at least one securing edge protector protecting said at least one longitudinal rail edge and simultaneously securing the respective seal in the respective panel;

(d) said at least one securing edge protector having a surface leg and a securing leg; and

(e) said securing leg overlapping at least part of an upper surface of a respective seal.

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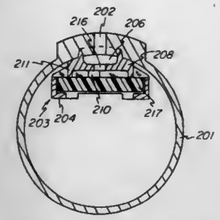
5,813,603
LOW THROUGHPUT WATER SYSTEM FLOW CONTROL MEMBERS AND METHODS OF INHIBITING SWELLING OF SUCH MEMBERS
Thomas E. Kurtz, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio
Filed Jan. 15, 1997, Ser. No. 782,686
Int. Cl.[6] A01G *25/16*
U.S. Cl. 239—1 **63 Claims**

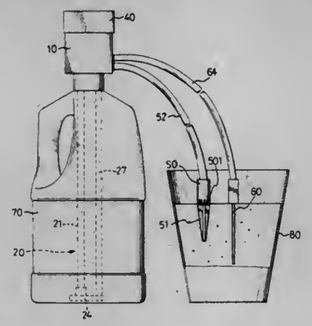


46. Method of inhibiting swelling of an elastomeric flow control member comprising contacting said elastomeric flow control member with a fluid comprising an inorganic or organic impurity that would in the absence of treatment cause swelling of said member, treating said member to inhibit said swelling by providing said member with an elastomeric composition comprising an elastomer selected from the group consisting of (1) halogenated butyl elastomers and (2) diene nitrile elastomers, and mixtures of (1) and (2).

5,813,604
PERSONALIZED NAME STRAW
Anthony Frassetti, 7 Stonebridge Court, Manalapan, N.J. 07726
Continuation-in-part of Ser. No. 529,343, Sep. 18, 1995, abandoned. This application Jun. 12, 1997, Ser. No. 873,801
Int. Cl.[6] A47G *21/18*
U.S. Cl. 239—33 **6 Claims**

1. A personalized name straw comprising:
first, second and third intercoupled components forming a drinking straw of desired configuration;
with said second component being in the nature of a name personalized to a user and having a conduit therein to channel liquid from one end thereof to an opposite end thereof;
with one of said first and said third components being of generally tubular configuration arrangeable for placement into a liquid retaining container for the sipping of liquid therethrough;
and wherein said second component includes a plurality of letters abutting one another in forming the name of said user, with a plurality of interconnecting spacers between openings in the adjacent letters thereof at a point substantially where each of said abutting letters touch;
and wherein said first, said second and said third components are colinearly intercoupled for channeling liquid through said other of said first and said third components into the last letter of the user's name, through said interconnecting spacers and through said adjacent letters into the first letter of the user's name, and from there through said one of said first and said third components into the user's mouth;
and wherein said first, said second and said third intercoupled components are colinearly coupled for alternatively channeling liquid through said one of said first and said third components into the first letter of the user's name, through said interconnecting spacers and through said adjacent letters into the last letter of the user's name, and from there through said other of said first and said third components into the user's mouth;
wherein said abutting adjacent letters of said second component are of a height H_1 several times greater than said diameter D_1, and
wherein said first and said third components are of a given diameter D_1, and wherein said first and second third components taper away from said intercoupled second component to a diameter D_2, slightly less than said diameter D_1.

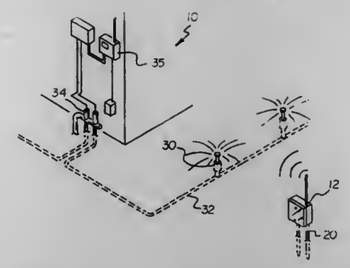
5,813,605
IRRIGATION ASSEMBLY OF POTTED PLANTS
Tsung-Li Chou, 2nd Fl., No. 15, Lane 70, Hulin St., Taipei, Taiwan
Filed May 12, 1997, Ser. No. 854,835
Int. Cl.[6] B05B *12/12*
U.S. Cl. 239—64 **10 Claims**



1. An irrigation assembly for plants, comprising:
a housing for containing batteries and a motor therein with a drain hole defined in one side of said housing;
a water pumping means extending from a bottom portion of said housing to a container, said water pumping means pumping water contained in said container into said housing through said water conduit and discharging said water from said drain hole;
a water outlet means connected to said drain hole of said housing through a water discharge pipe;
a control circuit-printed circuit board means with rotary switches for setting a fixed-humidity/fixed-amount selection and a control circuit for controlling the electrical conduction opportunity of said motor formed thereon; and
a humidity sensing means connected to said housing by electric wires in a waterproof cable, said humidity sensing means formed in a long strip, having a plurality of electrode contacts formed at various positions on a front surface and a rear surface thereof, and being directly inserted into soil of said potted plants.

5,813,606
RADIO CONTROLLED SPRINKLER CONTROL SYSTEM
Raymond Ziff, 28052 Tefir St., Mission Viejo, Calif. 92692
Filed Apr. 4, 1997, Ser. No. 826,569
Int. Cl.[6] A01G *25/00;27/00*
U.S. Cl. 239—67 **2 Claims**

2. A radio controlled water apparatus control system comprising:
at least one transmitter unit including a housing, each housing having at least one moisture sensor having a top end coupled to the bottom face thereof and a bottom end for allowing the moisture sensor to be inserted within the ground, the moisture sensor adapted to generate a moisture signal representative of the moisture level of the ground in which it is inserted, each transmitter unit further including a radio transmitter situated in the interior space thereof and connected to the moisture sensor for transmitting an activation signal via free space upon the receipt of a moisture signal which is representative of a moisture level below a predetermined level of moisture;
at least one set of water apparatuses situated adjacent an associated transmitter unit, the set of water apparatuses connected to a water source via a common distribution pipe;
at least one valve connected to an associated distribution pipe, each valve adapted to allow the supply of water through the associated distribution pipe to the corresponding water apparatuses upon the receipt of a valve actuation signal, each valve further adapted to preclude the supply of water through the associated distribution pipe to the corresponding water apparatuses upon the lack of receipt of the valve actuation signal; and
a receiver unit including a radio receiver connected to each of the valves and adapted to transmit a valve actuation signal to a valve only upon the receipt of the activation signal via free space from the corresponding transmitter unit;
wherein the housing of the transmitter unit includes a rear face, a top face, a bottom face, and a pair of side faces defining a front opening and interior space, the transmitter unit further including a transparent plate coupled over the front opening wherein a gasket is situated between the housing and the transparent plate for preventing moisture from entering the interior space of the housing and a control knob situated within the interior space of the housing adjacent the transparent panel for allowing a user to select the predetermined level of moisture, whereby the setting of the knob may be viewed from outside the housing.

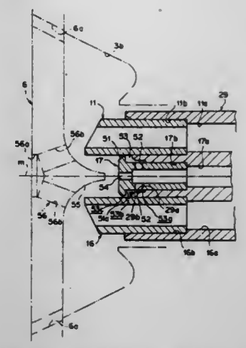


5,813,607

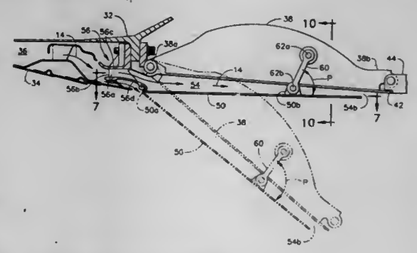
Patent Not Issued For This Number

5,813,608
MULTI-COLOR ROTARY SPRAYGUN AND METHOD OF CLEANING THE SAME
Hidehisa Yoshioka, and Nobubiro Takaba, both of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan
Filed Jan. 11, 1996, Ser. No. 584,017
Claims priority, application Japan, Jan. 10, 1995, 7-001943; Dec. 25, 1995, 7-337476
Int. Cl.[6] B05B *15/02*
U.S. Cl. 239—110 **25 Claims**

1. A multi-color rotary spraygun comprising a bell-shaped head which is supported for rotation on a front end of a casing and the front end portion of which is covered with a partition wall having coating material spraying ports, and a plurality of coating material lines which open into the bell-shaped head at their front ends and are respectively connected to separate coating material sources at their base ends, a coating material supplied to the bell-shaped head from one of the coating material sources through one of the coating material lines being atomized and sprayed on an object through the spraying ports by rotation of the bell-shaped head, wherein the improvement comprises that
the front end portion of a cleaner line which is connected to a cleaner source at its base end is disposed in said bell-shaped head and the front end portion of said coating material lines are disposed around the front end portion of the cleaner line; and
a coating material line nozzle opening is provided in a peripheral wall of the front end portion of the cleaner line and cleaner supplied from the cleaner source through the cleaner line is ejected radially through the coating material line nozzle opening and cleans the front end portions of the coating material lines.



5,813,609
HINGED LINED EXHAUST NOZZLE
Robert J. Ellerhorst, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Dec. 11, 1996, Ser. No. 763,791
Int. Cl.[6] G64D *33/04*
U.S. Cl. 239—127.3 **13 Claims**



11. An exhaust nozzle comprising:
an annular casing;
respective pluralities of circumferentially adjoining primary flaps and primary seals;
respective pluralities of circumferentially adjoining primary liners and seal liners spaced radially inwardly from respective ones of said primary flaps and seals; and
means for separately pivotally mounting each of said primary flaps, primary seals, primary liners, and seal liners to said casing.

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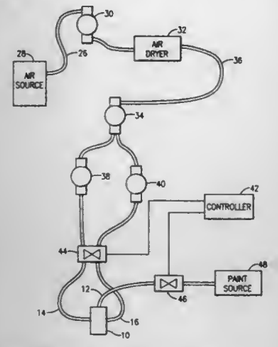
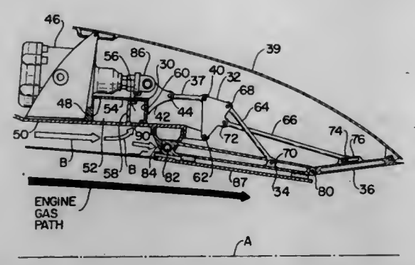
5,813,610
AIR DRYING SYSTEM WITH PAINT COATING APPARATUS
Aric J. Parr, and William W. Wyant, both of Fort Wayne, Ind., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Jan. 26, 1996, Ser. No. 592,205
Int. Cl.[6] B02B *1/24*
U.S. Cl. 239—135 **4 Claims**



1. A paint coating apparatus comprising:
a pressurized source of air;
moisture removal apparatus connected to said pressurized source of air, said moisture removal apparatus being operative to remove moisture from air received from said pressurized source of air so as to produce dry air leaving the moisture removal apparatus;
at least a first regulated valve downstream of said moisture removal apparatus for regulating the flow of the dry air from the moisture removal apparatus to a paint gun when paint is being supplied to the paint gun from a pressurized source of paint whereby the flow of dry air from said first regulated valve to the paint gun is at a particular flow rate when paint is being supplied to the paint gun, said paint gun being connected to the pressurized source of paint, said paint gun furthermore having a nozzle with an outlet end and a paint flow channel therein for defining at least one path of flowing liquid paint from the pressurized source of paint to the outlet end of the nozzle, said nozzle furthermore having at least one path for defining the flow of air received from at least the first regulated valve whereby the air at the outlet end of the nozzle intercepts the flowing liquid paint at the outlet end of the nozzle and thereby atomizes the liquid paint exiting from the paint flow channel at the outlet end of the nozzle; and
a second regulated valve downstream of said moisture removal apparatus for delivering the dry air to the at least one path in the nozzle for defining the flow of air received from the at least first regulated valve at a flow rate different than the flow rate of delivered dry air from said first regulated valve downstream of said air moisture removal apparatus when paint is not being supplied to the paint gun from the pressurized source of paint.

5,813,611
COMPACT PRESSURE BALANCED FULCRUM-LINK NOZZLE
Alfredo Cires, Palm Beach Gardens, and Jennifer Groceman, Lake Worth, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Sep. 27, 1996, Ser. No. 721,890
Int. Cl.[6] B64C *15/06*
U.S. Cl. 239—265.37 **8 Claims**

1. A C/D exhaust nozzle for gas turbine engine power plants powering aircraft, said exhaust nozzle including convergent flaps

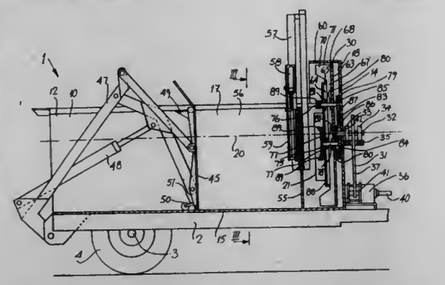


and divergent flaps, a synchronization ring means for positioning said convergent flaps and said divergent flaps, means for actuating said exhaust nozzle to change its C/D configuration, said means includes an actuator connected to said synchronization ring means, said synchronization ring means defining piston means for balancing the loads created by said convergent flaps and said divergent flaps whereby the actuation force required by said actuator is reduced.

5,813,612

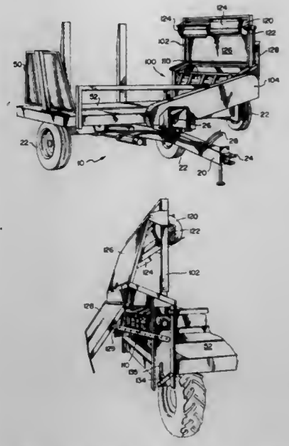
Patent Not Issued For This Number

5,813,613
APPARATUS FOR SPREADING MATERIAL AND A DISPENSING ROTOR FOR USE IN APPARATUS
Richard Keenan; John Keenan; Richard Christopher Moore, and James English, all of Bagenalstown, Ireland, assignors to Vetron Holdings Limited, Bagenalstwon, County Carlow, Ireland
PCT No. PCT/IE95/00023, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/26129, PCT Pub. Date Oct. 5, 1995
PCT Filed Mar. 29, 1995, Ser. No. 718,435
Claims priority, application Ireland, Mar. 29, 1994, S940270; Dec. 30, 1994, S941008
Int. Cl.[6] A21C *19/02*
U.S. Cl. 239—676 **21 Claims**

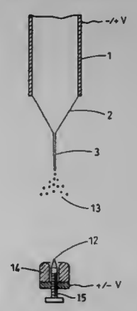


1. Apparatus for spreading material, the apparatus comprising:
an elongated container (**10**) for the material extending from an upstream end (**12**) to a downstream end (**14**) and defining a longitudinally extending central axis (**20**),
a dispensing outlet (**21**) from the container (**10**) being located adjacent the downstream end (**14**) thereof,
a dispensing rotor (**30,100,110**) mounted in the container (**10**) adjacent the downstream end (**14**) defining a main rotational axis (**20**), the main rotational axis (**20**) extending parallel to the central axis (**20**) of the container (**10**), the dispensing rotor

(**30, 100, 110**) being rotatable about the main rotatable axis (**20**) for dispensing material from the container (**10**) through the dispensing outlet (**21**), and
a separating means (**75,76,111**) mounted on the dispensing rotor (**30,100,110**) for separating material for dispensing by the dispensing rotor (**30,100,110**) from the mass of material in the container (**10**), the separating means (**75,76,111**) being rotatably mounted on the dispensing rotor (**30,100,110**) about a secondary rotational axis (**94,95**), and being rotatable relative to the dispensing rotor (**30,100,110**) for ripping and separating the material for dispensing from the mass of material.



5,813,614
DISPENSING DEVICE
Ronald Alan Coffee, Haslemere, United Kingdom, assignor to Electrosols, Ltd., Surrey, United Kingdom
PCT No. PCT/EP95/01162, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/26235, PCT Pub. Date Oct. 5, 1995
PCT Filed Mar. 28, 1995, Ser. No. 718,563
Claims priority, application United Kingdom, Mar. 29, 1994, 9406255
Int. Cl.[6] B05B *5/00*
U.S. Cl. 239—690 **15 Claims**



1. A dispensing device comprising an exposed, unshielded comminution site, means for supplying liquid to the comminution site, means for charging the comminution site to a potential for causing electrohydrodynamic comminution of liquid supplied to the comminution site, a discharge electrode for at least partially discharging comminuted matter, means for charging the discharge electrode to a polarity opposite to that of the comminution site to cause ionization of gaseous molecules in the vicinity of the discharge electrode, the discharge electrode being arranged so as to face towards the comminution site to cause gaseous ions produced by the discharge electrode to be directed towards the comminution site to at least partially discharge comminuted matter produced by the comminution site.

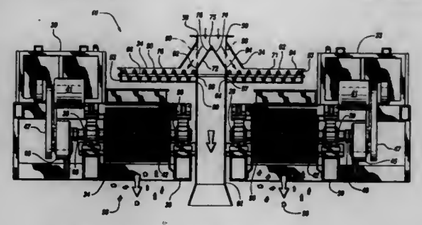
5,813,615

Patent Not Issued For This Number

5,813,616
BALE PROCESSOR
James Vandervalk, Fort Macleod, Canada, assignor to Fastec Manufacturing, Fort MacLeod, Canada
Filed Nov. 29, 1996, Ser. No. 759,090
Int. Cl.[6] B02C *18/06;21/02*
U.S. Cl. 241—101.76 **15 Claims**

1. An apparatus for separating and selectively chopping a bale of crop material comprising:
means for supporting at least one bale of crop material;
an elongate rotatable member adjacent the means for supporting a bale;
fingers on the rotatable member for separating and drawing crop material from the bale and expelling it from the apparatus;
a discharge outlet for directing the expelled material;
means to advance a bale relative to the rotatable member;
retractable cutting members for cooperation with the fingers to selectively chop the separated crop material; and
means for adjusting the height of retractable cutting members.

5,813,617
DUAL FEED WOOD CHIP DESTRUCTURING DEVICE
Eduard J. Thoma, Powell River, Canada, assignor to Beloit Technologies, Inc., Wilimington, Del.
Filed Mar. 19, 1997, Ser. No. 820,803
Int. Cl.[6] B02C *4/28*
U.S. Cl. 241—135 **10 Claims**



1. A chip destructuring system comprising:
a first pair of opposed rolls having aggressive surfaces and mounted to form a first nip therebetween;
a second pair of opposed rolls having aggressive surfaces and mounted to form a second nip therebetween, the second pair of rolls being mounted adjacent to the first pair of rolls so a line defined by the first nip passes substantially through the second nip formed by the second pair of rolls;
a chip distribution system positioned to distribute chips to both nips, said system further comprising:
a motor driven shaft having a first right handed auger and a second left handed auger spaced from the first right handed auger:
a housing containing the shaft and being divided into three portions. a first portion containing the first right handed auger, a second portion containing a portion of the shaft between the

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first right handed auger and the second left handed auger, and a third portion containing the left handed auger:

a first baffle and a second baffle which extend upwardly from the housing and are pivotally mounted to the housing, wherein the first baffle is pivotal between a positioned extending into the second portion of the housing and a position separating the first portion of the housing from the second portion of the housing, and wherein the second baffle is pivotal between a position extending into the second portion of the housing and a position separating the third portion of the housing from the second portion of the housing.

5,813,618

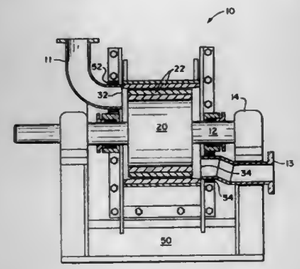
CONTINUOUS CYCLINDRICAL WOOD PULP REFINER

Stanley R. Prew, Williamsport, Pa., assignor to Andritz Sprout-Bauer, Inc., Muncy, Pa.

Filed Nov. 28, 1995, Ser. No. 563,773

Int. Cl.[6] B02C *19/00*

U.S. Cl. 241—259.1 **20 Claims**



1. A refiner for mechanically treating fibrous slurry, comprising:

means for forming a first grinding face comprising a plurality of refining plates;

a housing disposed around said means for forming a first grinding face, said housing having inlet means for continuously receiving a fibrous slurry, outlet means for continuously discharging a refined slurry, and mounting means for mounting said refining plates, said mounting means comprising a plurality of holder portions, each of said holder portions comprising first and second bores, each of said bores having a surface, wherein at least one of said refining plates is mounted to each of said holder portions;

a plurality of cam shafts, each of said cam shafts having a cam portion, a said cam portion of a said cam shaft being disposed in each of said bores wherein said cam portion is engageable with said surface;

a cylindrical rotor member situated within said housing and having a surface forming a second grinding face, said second grinding face being juxtaposed with said first grinding face along the entire periphery of said second grinding face, said first and second grinding faces defining a generally annular refining gap therebetween in fluid communication with said inlet and said outlet; and

a horizontal shaft penetrating the housing and connected to the rotor member for spinning the rotor about a horizontal rotation axis, wherein each of said bores is substantially parallel to said axis;

wherein each of said refining plates of said first grinding face is positionable to adjust said refining gap.

5,813,619

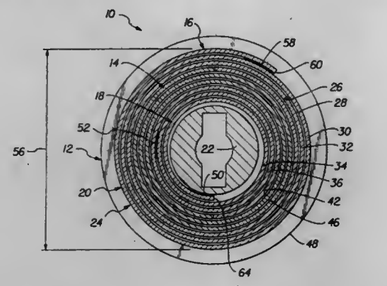
FILM ASSEMBLAGE

Jeffrey C. Robertson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 9, 1997, Ser. No. 835,937

Int. Cl.[6] B65H *18/28*

U.S. Cl. 242—160.4 **11 Claims**



1. A film assemblage comprising a spool core, and a filmstrip, a film leader and a film trailer which are to be wound as a single longitudinal strip on said spool core in a roll with said filmstrip extending between said film leader and said film trailer in order that the film leader, the filmstrip and the film trailer form a common inner side of the roll and a common outer side of the roll, is characterized in that:

said film trailer has a discrete cohesive patch located to be on the inner side of the roll and a discrete cohesive patch located to be on the outer side of the roll, which can only stick to one another other and not to the inner or outer sides of the roll, and which are spaced apart along the film trailer a distance substantially equal to the circumference of the roll, whereby when said film leader, said filmstrip and said film trailer are wound on said spool core with the film trailer being an innermost convolution of the roll and the film leader being an outermost convolution of the roll said cohesive patches will be separate from each other to prevent them from sticking to one another, but when said film leader, said filmstrip and said film trailer are wound on said spool core with the film leader being the innermost convolution of the roll and the film trailer being the outermost convolution of the roll said cohesive patches will be facing each other to stick to one another.

5,813,620

SPINNING REEL FOR FISHING COMPRISING ROTATIONAL BALANCING WEIGHTS

Akira Yamaguchi; Kazuo Hirano, and Masagi Saito, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 115,708, Sep. 3, 1993, abandoned. This application Aug. 15, 1996, Ser. No. 698,272

Claims priority, application Japan, Sep. 4, 1992, 4-67950 U; Sep. 4, 1992, 4-67951 U; Dec. 29, 1992, 4-93399 U; Feb. 22, 1993, 5-056503; Mar. 12, 1993, 5-077413; Mar. 12, 1993, 5-077414; May 10, 1993, 5-29642 U

Int. Cl.[6] A01K *89/01*

U.S. Cl. 242—232 **45 Claims**

1. A spinning reel for fishing, comprising:

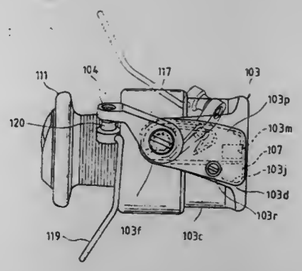
a bail which can be inverted into either of a fishline winding position and a fishline unwinding position;

a pair of first and second bail support members supporting said bail thereon, said first bail support member having a fishline guide; and

a rotor defining a first axis around which said rotor is rotatable and having a pair of first and second support arms located opposite to each other across said first axis, said first and second support arms supporting said first and second bail support members, respectively, so as to permit said first and second bail support members to pivot around a second axis, said rotor further defining with respect to said first axis a fishline winding side to which said bail in said fishline winding position belongs and a fishline unwinding side to which said bail in said fishline unwinding position belongs, and wherein:

said second axis is off-set from said first axis in a direction away from said fishline winding side toward said fishline unwinding side; and

first and second balancers for improving rotative balance of said rotor are respectively provided in said first and second support arms, said first and second balancers being located in said fishline winding side.



5,813,621

REEL TABLE MOVING MECHANISM OF TAPE RECORDER

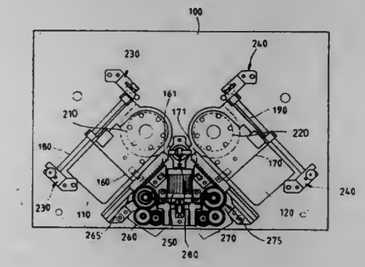
Jae-yong Eum, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Nov. 25, 1996, Ser. No. 756,246

Claims priority, application Rep. of Korea, Dec. 27, 1995, 1995 59532

Int. Cl.[6] G03B *23/02*

U.S. Cl. 242—336 **10 Claims**



1. A system including a reel table moving mechanism of a tape recorder and first and second tape cassettes of a different size that are selectively received by the reel table moving mechanism of the tape recorder, said first and second tape cassettes each comprising:

a stopper for locking a pair of reels and a releasing lever for releasing the stopper, and

said reel table moving mechanism comprising:

a deck member having first and second openings formed to be spaced apart from each other and each having a predetermined length;

a pair of reel tables, operative to move along said first and second openings, for selectively receiving the first and second tape cassettes of a different size;

a pair of first and second reel bases on which said reel tables are respectively mounted;

first and second shafts disposed at one side of each of said first and second openings are slidably connected to said first and second reel bases, respectively;

supporting means, fixed to said deck member, for supporting said first and second shafts;

means for moving said first and second reel bases; and

first and second releasing means for releasing the releasing lever of the first and second tape cassettes from being locked, said first and second releasing means being provided independently of each other to prevent interference therebetween.

5,813,622

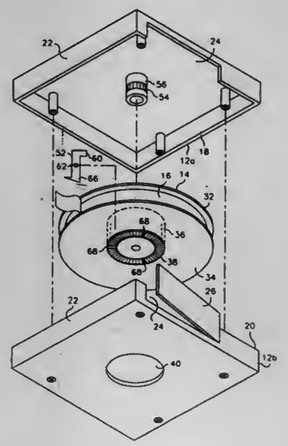
TAPE CARTRIDGE REEL LOCK

Thomas W. von Alten, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 12, 1997, Ser. No. 968,060

Int. Cl.[6] G11B *23/087*

U.S. Cl. 242—348 **11 Claims**



1. A tape cartridge, comprising:

a housing having a first section and an opposing second section, the second section of the housing having an opening therein;

a reel rotatable disposed in the housing, the reel having a hub and a plurality of spaced apart parallel flanges extending out from the hub;

a tape drive interface on the reel, the tape drive interface accessible through the opening and operative to couple the reel to a tape drive so that the tape drive can rotate the reel in the housing;

an arm moveably mounted in the hub, the arm operative between a first position in which the arm engages the housing to prevent the reel from rotating in at least one direction and a second position in which the arm does not engage the housing and the reel is free to rotate in both directions; and

a stop connected to the first section of the housing, the stop projecting into the hub and wherein the arm engages the stop when the arm is in the first position and the arm does not engage the stop when the arm is in the second position.

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5,813,623

DEVICE FOR APPLYING A MATERIAL STRIP TO A WINDING TUBE

Armin Hutzenlaub, and Dieter Düppengiesser, both of Wiehl, Germany, assignors to Kampf GmbH & Co. Maschinenfabrik, Wiehl, Germany

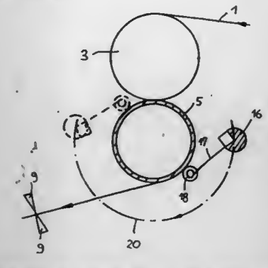
PCT No. PCT/EP96/00317, § 371 Date Jul. 28, 1997, § 102(e) Date Jul. 28, 1997, PCT Pub. No. WO96/23720, PCT Pub. Date Aug. 8, 1996

PCT Filed Jan. 26, 1996, Ser. No. 894,310

Claims priority, application Germany, Jan. 30, 1995, 195 02 769.8

Int. Cl.[6] B65H *35/04;18/08*

U.S. Cl. 242—527.4 **6 Claims**



1. An apparatus for winding a web on a sleeve, the apparatus comprising:

at least one winding shaft adapted to hold the sleeve and pivotal into a winding position coaxial with a winding axis and into a takeoff position spaced therefrom;

means including a contact roller around which the web passes for pressing the web radially toward the winding axis, whereby when a sleeve is in the winding position the contact roller presses the web against it;

cutting means for severing the web when same extends from the contact roller to the takeoff position between the contact roller and the takeoff position and thereby producing a leading web end extending from between the contact roller and a sleeve in the winding position; and

applying means including

a connecting rod pivotal about the winding axis and extending a full working width of the machine,

pressure elements extending from the connecting rod and having free ends, and

respective rollers on the free ends engageable with the web for pressing the leading end against the sleeve in the winding position after severing of the web.

5,813,624

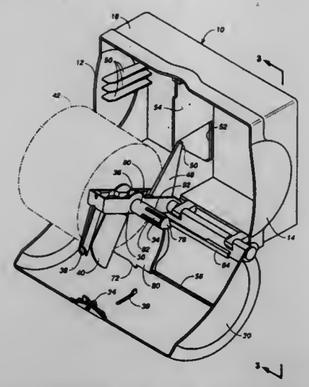
APPARATUS FOR DISPENSING TOILET TISSUE FROM ROLLS

Kamala J. Grasso, Wayland; Jason E. Short, Cambridge, both of Mass.; Robert Mervar, Hillsboro, Oreg.; John R. Moody, Antioch, Calif.; Douglas W. Johnson, Appleton, Wis., and Peter D. Johnson, Newtown, Conn., assignors to Fort James Corporation, Richmond, Va.

Filed Oct. 10, 1996, Ser. No. 728,208

Int. Cl.[6] B65H *67/02*

U.S. Cl. 242—560 **7 Claims**



1. Apparatus for dispensing toilet tissue from rolls of toilet tissue, said apparatus comprising, in combination:

a double-ended housing defining a housing interior and including a first housing member and a second housing member connected to said first housing member and movable relative to said first housing member between an open position and a closed position;

roll support means including first and second roll support spindles for supporting first and second rolls of toilet tissue in a coaxial relationship with said first roll of toilet tissue located adjacent to one of the ends of said housing, the second roll of toilet tissue located adjacent to the other of the ends of said housing, and adjacent ends of said rolls to toilet tissue defining a space therebetween, said roll support means including a support frame pivotally conected to said first housing member, said roll support spindles projecting outwardly from said support frame in opposed directions, pivotal movement of said support frame relative to said first housing member causing said roll support spindles to move either toward or away from said first housing member, said support frame including a projection having a distal end defining a recess and said support frame defining an opening spaced from said recess;

stabilizer means for stabilizing said support frame when said second housing member is in closed position including a stabilizer member extending from said second housing member and positioned in the recess formed in the distal end of the projection of the support frame when the second housing member is in closed position to contribute to the structural stability of said projection and a stabilizer structural element extending from said first housing member into the opening in said support frame when the second housing member is in closed position;

a cover slidably positioned on said second housing member and selectively slidably movable relative to said housing between a first cover location in which said first roll of toilet tissue would be exposed for manual access and said second roll of toilet tissue would not be exposed for manual access and a second cover location wherein said second roll of toilet tissue would be exposed for manual access and said first roll of toilet tissue would not be exposed for manual access; and

locking means for locking said cover against slidable movement relative to said second housing member between said first and second cover locations until substantial depletion of one of said rolls of toilet tissue, said locking means including a toilet tissue roll end engagement member pivotally mounted on said roll support means at a location between said first and second roll support spindles, dependent from said roll support means, and positioned in the space defined by adjacent ends of toilet tissue rolls supported by said roll support means and detents on said cover engageable with said toilet tissue roll end engagement member, said toilet tissue roll end engagement member depending from the projection of the support frame, freely pivotally mounted on said projection and continuously urged by the force of gravity into a substantially vertical orientation in the space defined by adjacent ends of toilet tissue rolls supported by said roll support means when said second housing member is in closed position, and a detent projecting from said cover urging said toilet tissue roll end engagement member to an inclined orientation when a force is exerted on said cover effecting sliding movement of said cover relative to said housing; and

means for limiting pivotal movement of said support frame to limit the distance said roll support spindles may be moved away from said first housing member.

5,813,625

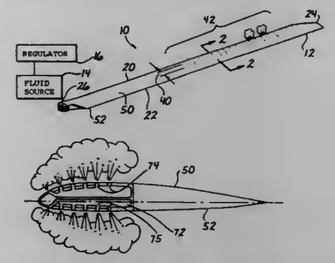
ACTIVE BLOWING SYSTEM FOR ROTORCRAFT VORTEX INTERACTION NOISE REDUCTION

Ahmed A. Hassan; Friedrich K. Straub, both of Mesa; David B. Domzalski, Gilbert, and Dennis K. Kennedy, Mesa, all of Ariz., assignors to McDonnell Douglas Helicopter Company, Mesa, Ariz.

Filed Oct. 9, 1996, Ser. No. 727,980

Int. Cl.[6] B64C *27/00*

U.S. Cl. 244—17.11 **20 Claims**



1. An active control device for reducing blade-vortex-interaction (BVI) noise generated by a rotorcraft having a rotor blade including an interior, a tip end, a root end, a leading edge, a trailing edge, an upper surface, a lower surface, a radius, and a chord, the rotor blade being attached at the root end to a rotor hub on the rotorcraft and extending radially outwardly therefrom such that when the rotor hub is rotatably driven the rotor blade rotates about the hub through a 360 degree azimuth, the active control device comprising:

a fluid source adapted for providing pressurized fluid to the interior of the rotor blade; and

a plurality of apertures disposed along a substantial surface area of the rotor blade on both the upper surface and the lower surface near both the leading edge and the tip end of the rotor blade, the plurality of apertures being adapted for directing the pressurized fluid out of the interior of the rotor blade and in a direction generally normal to the blade surface.

5,813,626

SUSPENSION DEVICE FOR A TRANSMISSION BOX OF A ROTARY-WING AIRCRAFT

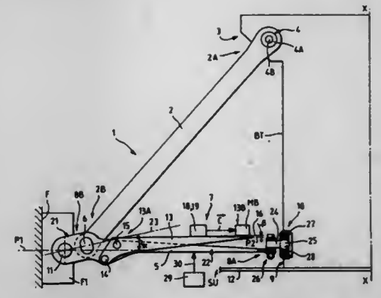
Elio Zoppitelli, Bouc Bel Air, and Laurent Jean Daniel Girard, Marseille, both of France, assignors to Eurocopter France, Marignane, France

Filed Apr. 3, 1997, Ser. No. 832,105

Claims priority, application France, Apr. 3, 1996, 96 04168

Int. Cl.[6] B64C *27/51*

U.S. Cl. 244—17.27 **14 Claims**



1. Suspension device for a transmission box (BT) of a rotary-wing aircraft, the said transmission box (BT) being mounted between propulsion means and a lift rotor of the said aircraft such that it is substantially longitudinal to the axis (X—X) of the said rotor and being suspended with respect to the fuselage (F) of the said aircraft, the said suspension device (I) including:

bearing pieces (2) distributed radially around the said transmission box (BT), the upper ends (2A) of which are connected to the upper part (3) of the transmission box (BT) and the lower ends (2B) of which are articulated to suspension leaves (5);

a suspension system (SU) connecting the lower part (9) of the transmission box (BT) to the fuselage (F) of the aircraft and especially including the said suspension leaves (5) which are distributed radially about the said transmission box (BT) in a plane (P1) substantially orthogonal to the axis (X—X) of the rotor, the radially inner ends (8A) of which are fixed to the lower part (9) of the said transmission box (BT), and the radially outer ends (8B) of which are articulated to the fuselage (F); and

resonator means (7) associated respectively with the said bearing pieces (2), each of the said resonator means (7) including a mass support (13) which is secured by one of its ends (13A) to the suspension leaf (5) connected to the associated bearing piece (2), which has a longitudinal direction (16) passing through the axis (X—X) of the rotor, and which is equipped at its other end (13B) with a flapping mass (MB),

characterized in that it additionally includes tuning means (18, 19) associated with at least some of the said resonator means (7), each of the said tuning means (18, 19) being capable of tuning the natural frequency of the resonator means (7) with which it is associated, some of the said tuning means (18) including an additional flapping mass (18A) for tuning, the movement of which is controlled by an appropriate control means (18B), the said flapping mass (18A) for tuning being connected to the flapping mass (MB) of the resonator means (7) with which it is associated.

5,813,627

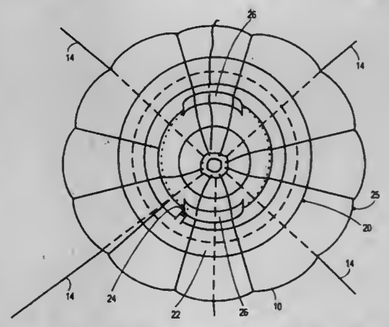
BALLOON SUPPORT APPARATUS FOR HOT AIR BALLOON RIDE

Mary K. Huntington, 1804 Davis, McHenry, Ill. 60050

Filed Mar. 31, 1997, Ser. No. 829,071

Int. Cl.[6] B64B *1/50;1/58;1/62*

U.S. Cl. 244—33 **14 Claims**



1. A balloon support apparatus for use in a hot air balloon ride, the apparatus elevating and maintaining a balloon envelope of the ride, said support apparatus comprising a sleeve having a doughnut configuration engaged within a crown area of the balloon envelope, the crown area incorporating tear away rip panels, said sleeve

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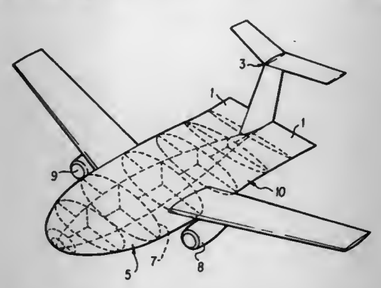
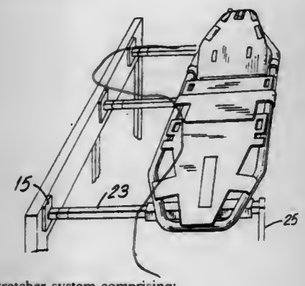
containing a predetermined amount of a lighter than air substance and avoiding contact with said rip panels.

5,813,628
LIFTING-FUSELAGE/WING AIRCRAFT HAVING LOW INDUCED DRAG
Robert W. Hahl, Falls Church, Va., assignor to Redwood Aircraft Corporation, Falls Church, Va.
Filed May 13, 1996, Ser. No. 642,998
Int. Cl.[6] B64C *1/00;3/54*
U.S. Cl. 244—36 **27 Claims**



1. An aircraft comprising:
(a) a lifting fuselage having a cross-section constituting an airfoil in a majority of vertical planes taken parallel to the flight direction and an aspect ratio (AR_f) of 0.33 to 1.10;
(b) wings fixed to the fuselage having an aspect ratio (AR_w) of at least 5.0, wherein said wings are without a trailing-edge flap that moves relative to the aircraft to reduce stall speed;
(c) a mechanism controlling aircraft attitude; and
(d) a mechanism propelling the aircraft;
wherein the wings and fuselage produce lift in varying proportions depending upon flight conditions as follows:
(i) the aircraft has a cruise design point in which the fuselage lift coefficient (C_{LF}) is 0.08 or less, and
(ii) the fuselage lift coefficient is at least 0.50 at an angle of attack (α_{LZ_0}) of 10°, in level flight at sea level (ISA) with all movable lift enhancing devices retracted.

5,813,629
AIRPLANE STRETCHER SYSTEM
Carlos Parra Cabrera, Dali 5, Comunidad, Villacana, 29689 Cancelado-Estepona, Spain
Filed Apr. 10, 1996, Ser. No. 631,734
Int. Cl.[6] B64D *11/00*
U.S. Cl. 244—118.6 **14 Claims**



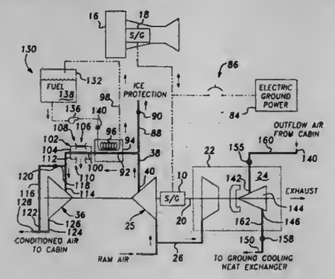
1. A stretcher system comprising:

a first horizontal stretcher support member having a first end and a first second end and a vertical stretcher support member having a first end and a second end, the first end of said horizontal stretcher support member being removably connected to a wall surface, the second end of said horizontal stretcher support member being connected to the first end of the vertical stretcher support member, the second end of the vertical stretcher support member being removably connected to a floor surface;

a second horizontal stretcher support member having a first end and a second end and a second vertical stretcher support member having a first end and a second end, the first end of said second horizontal stretcher support member being removably connected to said wall surface the second end of said second horizontal stretcher support member being connected to the first end of the second vertical stretcher support member, the second end of the vertical stretcher support member being removably connected to a floor surface; and

a stretcher removably connected to said first and second horizontal stretcher support members and wherein said first horizontal stretcher support member and said first vertical support member are not directly connected to said second horizontal stretcher member and said second vertical support member except when said stretcher is attached to said first and second horizontal stretcher support members.

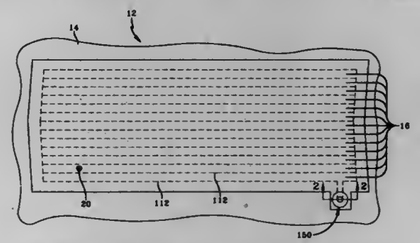
5,813,630
MULTI-MODE SECONDARY POWER UNIT
Kenneth R. Williams, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.
Filed Sep. 27, 1996, Ser. No. 721,907
Int. Cl.[6] B64D *13/00*
U.S. Cl. 244—118.5 **16 Claims**



1. A multi-mode secondary power unit comprising:
a shaft;
a first starter/generator unit operably coupled to said shaft;
said first starter generator motor being operable in a motor mode for causing rotational movement of said shaft and being operable in a generator mode for generating electric power from rotational movement of said shaft;
a thermal engine operably coupled to said shaft;
said thermal engine being operable in a fuel burning mode for causing rotational movement of said shaft and being operable in a non-fuel burning mode for receiving rotational movement from said shaft; and
a load compressor operably coupled to said shaft for pressurizing air to a predetermined level;
a vapor cycle compressor operably coupled to said shaft for pressurizing coolant to a predetermined level;
a vapor cycle conduit coupled to said vapor cycle compressor;
a pressurized conditioned air conduit coupled to said load compressor; and
said vapor cycle conduit being disposed in a thermal exchanging relation to said pressurized conditioned air conduit;
a fuel conduit;

a heat-exchanging section of said fuel conduit disposed in a first heat exchanger/condenser;
a first heat exchanging portion of said vapor cycle conduit disposed within said first heat exchanger/condenser proximate said heat-exchanging section of said fuel conduit such that thermal energy is transferred therebetween;
a second heat-exchanging portion of said vapor conduit disposed within a second heat-exchanger/evaporator; and
a portion of said pressurized conditioned air conduit disposed in said second heat-exchanger/evaporator proximate said second heat exchanging portion of said vapor conduit such that thermal energy is transferred therebetween.

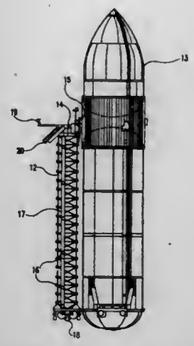
5,813,631
PNEUMATIC DEICING SYSTEM WITH DRAIN VALVE
Donald E. Butler; Richard L. Rauckhorst, III, both of North Canton; Thomas A. Waples, Mogadore, and Alan J. Fahrner, Canton, all of Ohio, assignors to The B. F. Goodrich Company, Richfield, Ohio
Filed Feb. 24, 1997, Ser. No. 804,774
Int. Cl.[6] B64D *15/18*
U.S. Cl. 244—134 A **8 Claims**



1. An apparatus for removing ice from an airfoil comprising:
a deicer having at least one inflatable member;
an inflation port in said deicer for providing access to said at least one inflatable member from a pressurized fluid source for inflation control of said deicer; and,
a drain valve integral with said deicer separate from said inflation port for providing access to said at least one inflatable member for draining fluids from said at least one inflatable member;
wherein said drain valve is closed during said inflation control of said deicer and opened during purging of accumulated fluids from the deicer.

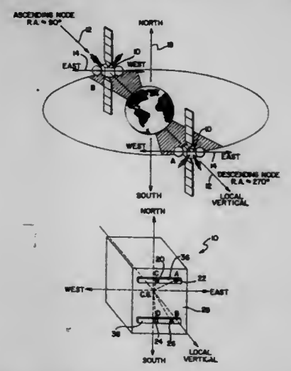
5,813,632
SALVAGE HARDWARE APPARATUS AND METHOD FOR ORBITING OBJECTS
Thomas C. Taylor, 3705 Canyon Ridge Arc, Las Cruces, N. Mex. 88011
Filed Oct. 2, 1995, Ser. No. 537,531
Int. Cl.[6] B64G *1/64*
U.S. Cl. 244—159 **18 Claims**

1. A method of placing a separate salvage subsystem package on a discarded orbiting object for salvaging the discarded orbiting object, the method comprising the steps of:
identifying a discarded orbiting object;
launching the separate salvage subsystem package including a compressed truss apparatus;
coupling the salvage subsystem package and compressed truss apparatus to the discarded orbiting object;
extending the compressed truss apparatus to provide a utility network with attachment points for payloads at a plurality of nodes for connection to a corresponding plurality of control systems provided by the salvage subsystem package; and



activating and controlling the plurality of control systems provided by the salvage subsystem package.

5,813,633
METHOD AND APPARATUS FOR STATIONKEEPING A SATELLITE OFFSET BY PITCH ROTATION
Bernard M. Anzel, El Segundo, Calif., assignor to Hughes Electronics Corporation, Los Angeles, Calif.
Filed Dec. 22, 1995, Ser. No. 577,573
Int. Cl.[6] B64G *1/26*
U.S. Cl. 244—169 **26 Claims**



1. A method of stationkeeping for a three-axis stabilized satellite having four thrusters mounted in a generally rectangular configuration on an anti-nadir face of the satellite, each of the four thrusters having a line of thrust which passes through the center of mass of the satellite, the four thrusters including a northwest thruster, a northeast thruster, a southwest thruster, and a southeast thruster, the method comprising the steps of:
rotating said satellite about a pitch axis that is perpendicular to a normal to said anti-nadir face of the satellite;
canting the northwest thruster and the northeast thruster away from the anti-nadir face in a north direction with respect to a north-south axis which passes through the center of mass of the satellite;
canting the southwest thruster and the southeast thruster away from the anti-nadir face in a south direction with respect to the north-south axis;
slewing the northeast thruster and the southeast thruster in an east direction about the north-south axis;
slewing the northwest thruster and the southwest thruster in an west direction about the north-south axis;

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firing the northeast thruster and the northwest thruster near an orbit ascending node;

firing the southeast thruster and the southwest thruster near an orbit descending node; and

wherein each of the four thrusters is fired in accordance with the amount that the satellite is rotated about the pitch axis.

5,813,634

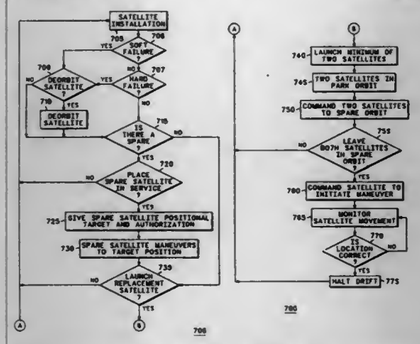
METHOD FOR REPLACING FAILING SATELLITES IN A SATELLITE COMMUNICATION SYSTEM

Joseph Camillo Pizzicaroli, Phoenix, Ariz., and Ronald E. Glickman, Boulder, Colo., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 23, 1995, Ser. No. 553,790

Int. Cl.[6] B64G *1/02*

U.S. Cl. 244—176 **17 Claims**



1. A method of replacing a failing satellite in a constellation of orbiting satellites that are moving rapidly with respect to earth's surface, each satellite of said constellation residing in one of several orbital planes, each of said several orbital planes having a spare orbit and an operational orbit associated therewith, said operational orbit having satellites that support communication services, said orbiting satellites within said several orbital planes communicate with each other over in-plane cross-links, said orbiting satellites of adjacent of said several orbital planes communicate with each other over cross-plane cross-links, said method comprising steps of:

providing for at least one of said several orbital planes, an orbiting spare satellite located in said spare orbit;

detecting said failing satellite in said operational orbit; and

commanding said orbiting spare satellite to replace said failing satellite,

shutting off one in-plane cross-links and one cross-plane cross-links of each satellite communicating with said failing satellite;

moving said orbiting spare satellite into a position previously occupied by said failing satellite; and

turning back on said in-plane cross-links and cross-plane cross-links.

5,813,635

TRAIN SEPARATION DETECTION

Emilio A. Fernandez, Montgomery County, Md., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Continuation-in-part of Ser. No. 799,882, Feb. 13, 1997, Pat. No. 5,738,311. This application Nov. 26, 1997, Ser. No. 979,310

Int. Cl.[6] B61L *3/00*

U.S. Cl. 246—168 **23 Claims**

1. A railroad train separation detector comprising:

a first communication and control unit in a locomotive of the railroad train, said first communication and control unit including a first microprocessor control circuit and a first transceiver, the first microprocessor control circuit periodically computing speed for the locomotive and the first transceiver transmitting and receiving messages to and from remote units in the train;

a second communication and control unit in a remote unit of the railroad train, the second communication and control unit including a second microprocessor control circuit and a second transceiver, the second microprocessor control circuit periodically computing speed for the remote unit; and

means at one of the first and second communication and control units for comparing speed computed by the first and second microprocessor units and, if the comparison is not within predetermined limits, declaring a train separation.

5,813,636

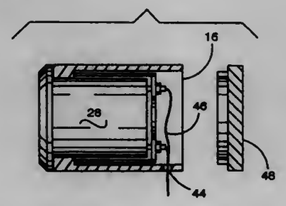
INSTRUMENT GAUGE HOLDERS

Gary W. Lollis, 1017 3rd St., Spencer, N.C. 28159

Continuation of Ser. No. 516,344, Aug. 17, 1995, abandoned. This application Sep. 19, 1997, Ser. No. 934,358

Int. Cl.[6] G12B *9/00*

U.S. Cl. 248—27.1 **1 Claim**



1. An instrument gauge holder for mounting an instrument gauge, said instrument gauge holder comprising:

a cylindrical tube comprising a first end, a second end and a continuous wall extending between said first end and said second end and defining an interior channel, said wall having an exterior surface, an interior surface and an aperture therethrough for permitting instrument gauge wires to pass through said wall, said exterior surface of said wall comprising a flat surface portion for mounting the instrument gauge holder on a flat surface, said tube further comprising a rim adjacent said first end and extending radially inwardly from the interior surface of said wall into the interior channel;

a mounting bracket comprising a pair of diametrically opposed braces for engaging said rim within the interior channel defined by said tube to mount the instrument gauge to the instrument gauge holder;

a cap comprising

a round disk having a front surface, a back surface and a continuous exterior edge; and

a lip adjacent the back surface of said disk and spaced radially outwardly from said continuous exterior edge;

whereby said continuous exterior edge of said disk is removably engagable with said interior surface of said tube adjacent said second end.

5,813,637

Patent Not Issued For This Number

5,813,638

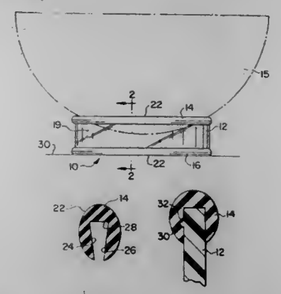
MIXING BOWL SUPPORTING ASSEMBLY

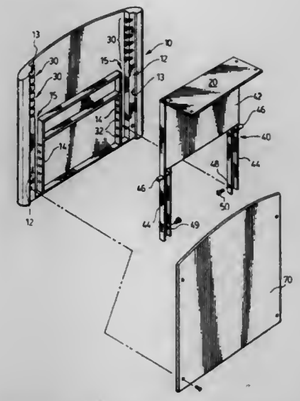
David F. Morris, 3811 Cantebury Rd., Apt. 503, Baltimore, Md. 21218, assignor to David F. Morris, Baltimore, Md.

Continuation-in-part of Ser. No. 405,760, Mar. 20, 1995, Pat. No. 5,639,617. This application May 7, 1997, Ser. No. 852,576

Int. Cl.[6] A47G *23/02*

U.S. Cl. 248—152 **16 Claims**





11. A supporting assembly for a mixing bowl comprising:

a support having first and second opposing free end edges and open ends defining a continuous interior space between said open ends; and

first and second holding members, each holding member having a coefficient of friction greater than that of said support, said first and second holding members covering, in overlapping relation, at least a portion of said first and second edges of said support respectively, said first and second holding members each having at least one annular groove adjacent to and interacting with a corresponding at least one annular ridge protruding outwardly from said support, each holding member being constructed and arranged such that when said supporting assembly is disposed with said first holding member in contact with a planar surface and a mixing bowl is at least partially disposed in said interior space with the second holding member contacting a peripheral surface of the mixing bowl, friction alone, between said mixing bowl and said second holding member and between said planar surface and said first holding member holds said bowl stationary with respect to said planar surface when contents of said mixing bowl are mixed.

5,813,639

WORK SURFACE END GABLE

John Hellwig, Toronto; Steve Verbeek, Aurora, and Genadij Makarewicz, Brampton, all of Canada, assignors to Teknion Furniture Systems (A Partnership of Teknion Holdings, Inc, and Birchgrove Investment Inc.), Downswren, Canada

Filed Apr. 28, 1997, Ser. No. 844,069

Int. Cl.[6] F16M *11/26*

U.S. Cl. 248—188.5 **3 Claims**

1. An end gable for supporting a work surface comprising a gable base and a gable extension securable to said gable base at a plurality of work surface height positions where each position defines a different support height for the work surface, said gable base having opposed ends, each said end having a column support which is releasably engageable with a respective vertical extension member of said gable extension at any of said work surface height positions, and wherein said gable base has a series of drop slots in each column support for receiving a lock pin on the respective vertical extension member in addition to a mechanical securement arrangement for locking of said gable extension to said gable base in one of said work surface height positions.

5,813,640

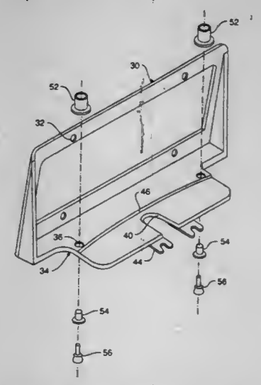
REMOVABLE LICENSE PLATE HOLDER AND MOUNTING SYSTEM

Albert C. Koch, Grapevine Canyon Rd., Inyokern, Calif. 93527, and Donald C. Gay, 608-B W. Perdew Ave., Ridgecrest, Calif. 93555-2569

Filed Aug. 29, 1994, Ser. No. 297,689

Int. Cl.[6] G09F *21/04*

U.S. Cl. 248—222.11 **18 Claims**



1. A license plate mounting bracket system adapted to mount a license plate to a selected vehicle, comprising:

an one-piece unitary bracket adapted to receive said license plate, having a top side, front and back sides and a bottom side, and a non-rotatable, rigidly secured flange portion extending rearwardly from said back side thereof having an opening therein adapted to align with an opening in a bottom surface of a portion of said selected vehicle, said bottom surface portion of said vehicle adapted to not be readily viewable under normal conditions of standing or crouching in front of said vehicle;

a fastener system, further comprising a bushing to be inserted in said opening in the bottom surface of a portion of said selected vehicle, an expandable grommet inserted in said

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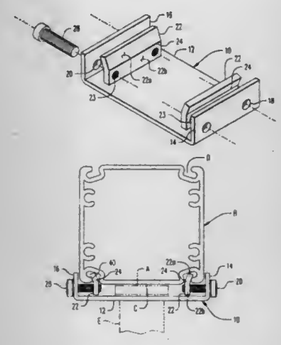
opening in said bracket adapted to align with said opening in said vehicle, and a plunger adapted to expand said grommet when inserted therein, which may be fastened manually without the use of tools; whereby the license plate may be mounted to said selected vehicle without the need to drill openings in normally viewable portions of said vehicle, and such mounting may be accomplished by hand without the use of tools by inserting said bushing into said opening of said vehicle, and said grommet into said bracket, then inserting said grommet into said bushing, and thereafter inserting said plunger into said grommet to expand said grommet, said grommet also expanding into said bushing to seat firmly in said bushing wherein when the bracket is assembled to said vehicle, the back side of said bracket is adapted to be spaced from said vehicle to prevent contact with the vehicle.

5,813,641
CLAMP BRACKET
David Baldwin, 80 Island Cir., Sarasota, Fla. 34242
Filed Sep. 30, 1996, Ser. No. 724,141
Int. Cl.[6] A47B *96/06*
U.S. Cl. 248—223.41 **9 Claims**



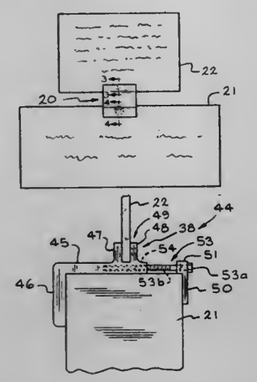
1. A removable, repositionable clamp bracket for clamping engagement only with an elongated channel member having side surfaces and two spaced parallel grooves extending along and into a front surface of the channel member, said clamp bracket comprising:

a generally U-shaped main member having an elongated central portion and substantially orthogonally extending end portions spaced apart slightly greater than a width of the one surface of the channel member;

two groove engaging members;

threaded means for adjustably positioning one said groove engaging member in spaced opposing relation with respect to each said end portion, said groove engaging members being spaced apart a distance generally equal to that of the grooves whereby, when said main member is positioned in close proximity to the one surface of the channel member, said groove engaging members extend into the grooves and clampingly engage thereagainst when said threaded means are tightened against the side surfaces.

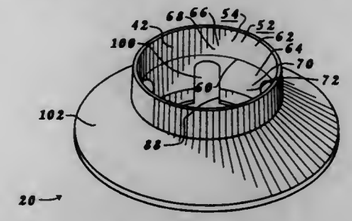
5,813,642
TOMBSTONE MEMORIAL PLAQUE AND SUPPORT BRACKET ASSEMBLY
David O. Warren, 4302 Ballantine Rd., Dewitt, Mich. 48820
Filed Sep. 19, 1996, Ser. No. 716,475
Int. Cl.[6] A47B *96/06*
U.S. Cl. 248—229.15 **3 Claims**



1. In a contoured tombstone engaging support bracket assembly for supporting a personalized memorial display plaque in a display position above and in parallel register with a tombstone comprising:

a contoured tombstone engaging support bracket assembly, said contoured tombstone engaging support bracket assembly having a front contoured downwardly extending tombstone engaging portion, said contoured tombstone engaging support bracket assembly having a rear contoured downwardly extending tombstone engaging portion in spaced-apart parallel register with said front contoured downwardly extending tombstone engaging portion so as to cooperate therewith to define a tombstone engaging recess therebetween, said rear contoured downwardly extending tombstone engaging portion having a recessed threaded tombstone retainer screw hole longitudinally therethrough, said recessed tombstone retainer screw hole operably provided with a tombstone engaging retainer screw therethrough to selectively retainably engage the upper portion of a tombstone positioned within said tombstone engaging recess so as to secure said contoured tombstone support bracket assembly in its operative use position across the top of the tombstone upon which it is mounted, said contoured tombstone engaging support bracket assembly having a centrally positioned forward contoured upper raised portion, said contoured tombstone engaging support bracket assembly having a centrally positioned rear contoured upper raised portion in spaced-apart parallel register with said forward contoured upper raised portion so as to cooperate therewith to define a transverse memorial display plaque engaging slot therebetween, said centrally positioned rear contoured upper raised portion having a recessed memorial display plaque retainer screw hole longitudinally therethrough, said recessed memorial display plaque retainer screw hole operably provided with a memorial display plaque retainer screw therethrough to selectively retainably engage the lower portion of a memorial display plaque selectively positioned within said transverse memorial display plaque engaging slot so as to secure the memorial display plaque in its operative use display position upon said contoured tombstone engaging support bracket assembly.

5,813,643
CYLINDER HOLDER FOR CYLINDRICAL TANK
Mark Zybert, 13000 Mortons Corners Rd., Springville, N.Y. 14141
Filed Sep. 11, 1997, Ser. No. 927,875
Int. Cl.[6] A47F *5/00*
U.S. Cl. 248—310 **20 Claims**



1. A cylinder holder to provide for an unattended holding of a cylindrical tank in a vertically oriented position on a work surface, the cylindrical tank having a valve end located at one end of the cylindrical tank, a sealed end located at the opposing end of the cylindrical tank and a lower tank outer surface uniformly dimensioned and radially disposed to extend from the sealed end along the cylindrical tank at least a portion of the way to the valve end, the cylinder holder comprising:

a) a support surface to provide for a contact with the work surface wherein the work surface is generally horizontally oriented;

b) a tank contacting chamber to provide for receiving a portion of the cylindrical tank, the portion of the cylindrical tank in close proximity to the sealed end, the tank contacting chamber comprising:

1) a tank contacting surface radially disposed about the tank contacting chamber, the tank contacting surface defining a vertically oriented perimeter of the tank contacting chamber and having a lower extent, the tank contacting surface to provide for a contact with the lower tank outer surface in close proximity to the sealed end of the cylindrical tank;

2) a plurality of extensions, each extension radially disposed about the tank contacting chamber and extending inward from the lower extent of the tank contacting surface, the plurality of extensions defining a lower perimeter of the tank contacting chamber, the extensions to provide for a contact with the sealed end of the cylindrical tank;

c) connection means to provide for positioning the support surface relative to the tank contacting chamber;

d) binding means to provide for a compression contact between at least a portion of the tank contacting surface of the tank contacting chamber and the lower tank outer surface of the cylindrical tank while the cylindrical tank is positioned within the tank contacting chamber to provide for retaining the cylinder holder on the cylindrical tank;

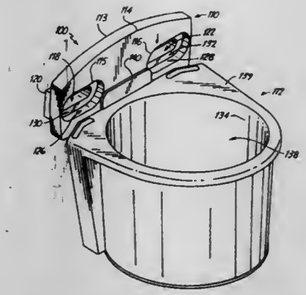
whereby the cylinder holder is retained on the cylindrical tank by the compression contact of the tank contacting surface with the lower tank outer surface of the cylindrical tank.

5,813,644
CONTAINER HOLDER WITH SEPARABLE SUPPORT
Peter W. A. Bergin, Hopkins, Minn., assignor to MTS Northwest, Sound, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 34,727, Feb. 10, 1995, Pat. No. Des. 368,628. This application Jan. 16, 1996, Ser. No. 585,801
Int. Cl.[6] A47K *1/08*
U.S. Cl. 248—311.2 **11 Claims**

1. A drink container holder for use with a seat back, comprising:

an open top receptacle comprising:

a side wall;



a lower end coupled to the side wall and opposite the open top of the receptacle, the side wall and lower end being suitable for supporting a drink container within the receptacle; and

a substantially vertical rear outer portion, the rear outer portion having at least one flange extending from an upper region of the rear outer portion to a position upwards of the open top of the receptacle, the rear outer portion also having a first attachment mechanism at a location below the at least one flange; and

a support for attaching the drink container to the seat back, the support comprising:

a seat back side and a receptacle side;

a first attachment member receiving aperture extending from the seat back side to the receptacle side and alignable with a hole in the seat back for receiving an attachment member and thereby securing the support to the seat back;

at least one flange receiving opening extending from the seat back side to the receptacle side for receiving the at least one flange; and

a second attachment mechanism on the support alignable with the first attachment mechanism of the open top receptacle when the at least one flange is inserted in the at least one flange receiving opening, wherein the open top receptacle is secured to the support and thereby to the seat back by first inserting the at least one flange into the receptacle side of the at least one flange receiving opening and then by attaching the open top receptacle to the support with the first and second attachment mechanisms of the open top receptacle and of the support, wherein the first attachment mechanism of the open top receptacle includes a sleeve extending outward from the rear outer portion at the location below the at least one flange, and wherein the attachment mechanism of the support includes a sleeve receiving opening adapted for receiving the sleeve therein when the at least one flange is inserted into the at least one flange receiving opening, the sleeve being adapted for receiving a threaded attachment after the sleeve is received in the sleeve receiving opening to thereby secure the open top receptacle to the support.

5,813,645
REMOVABLE DEVICE FOR HOLDING BEVERAGE CONTAINERS, DRINKING VESSELS OR THE LIKE, ESPECIALLY IN MOTOR VEHICLES
Hans Droste, Leonberg; Wolfgang Moebius, Schwieberdingen, and Leo Macho, Tiefenbronn, all of Germany, assignors to Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Mar. 10, 1997, Ser. No. 814,765
Claims priority, application Germany, Mar. 8, 1996, 196 09 022.9
Int. Cl.[6] A47K *1/08*
U.S. Cl. 248—311.2 **20 Claims**

1. A removable device for holding a container in a vehicle, comprising:

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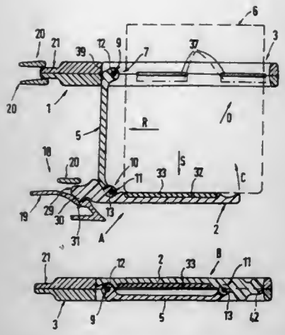


a receiving element having an inner periphery defining an opening;

a connecting arm having a first end and a second end, said first end being mounted to the receiving element; and

a lower support part which is mounted to said second end of the connecting arm,

said connecting arm and said lower support part being movable between an unfolded use position in which the connecting arm and the lower support part are arranged below the receiving element, and a folded storage position in which the connecting arm and the lower support part are received within said opening of the receiving element.

5,813,646

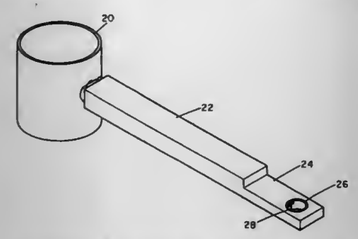
DEVICE FOR MOUNTING A RECEPTACLE

Edward E. Bartholomae, 2711 Ripple Springs, Arlington, Tex. 76016

Continuation of Ser. No. 541,452, Oct. 10, 1995, abandoned. This application Oct. 7, 1997, Ser. No. 946,051

Int. Cl.[6] A47K *1/08*

U.S. Cl. 248—311.2 **12 Claims**



12. An apparatus for supporting accessories, comprising:

a) a seat;

b) a seat base;

c) a seat mount comprising a first mounting member that is coupled to the seat and a second mounting member that is coupled to the seat base, the first and second mounting members being coupled to each other so as to support the seat upon the seat base, the first mounting member being rotatable with respect to the second mounting member;

d) an arm having a first end portion and a second end portion;

e) the arm first end portion having a receptacle mounted thereto;

f) the arm second end portion being coupled to the first mounting member so as to swivel with respect to the seat base;

g) the arm second end portion has an opening therein, the opening receiving the first mounting member;

h) the opening in the arm second end portion is formed by two projections separated from each other by a gap.

5,813,647

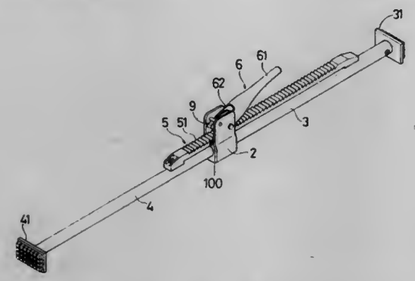
RETAINING/FIXING DEVICE

Ming-Chi Chen, No.25, lane 163, Kuo Tzu Keng, Ta-Ping City, Taichung Hsien, Taiwan

Filed Apr. 1, 1997, Ser. No. 831,437

Int. Cl.[6] B60P *7/15;* **B61D** *45/00*

U.S. Cl. 248—354.7 **3 Claims**



1. A retaining/fixing device comprising:

a base seat including a hollow section extending longitudinally therethrough and having a large diameter portion and a coaxial small diameter portion, said base seat having a top, a pair of fixing boards extending upward from said top of said base seat to define a channel therebetween, each of said fixing boards having a pivot hole and a stopper pin hole;

an outer tube fixed in said large diameter portion of said hollow section of said base seat;

an inner rod movably fitted in said small diameter portion of said hollow section of said base seat;

a rack disposed in said channel of said base seat, one end of said rack being secured to an inner end of said inner rod, said rack having multiple teeth, including a first tooth and a second tooth, each having a vertical face and an inclined face;

a handle having an elongated grip at one end thereof and a pair of parallel pivot sections at an opposing end thereof, said pivot sections being pivotally disposed in said channel of said base seat, each of said pivot sections having a first hole and a second hole formed therethrough, said handle having a first pivot shaft protruding through said first holes in each of said parallel pivot sections, and a second pivot shaft protruding through said second holes in each of said parallel pivot sections;

a first claw having one end thereof pivotally disposed on said first pivot shaft and another end of said first claw having a first end section with a sharp angle;

a second claw having a length shorter than that of said first claw, one end of said second claw being pivotally disposed on said second pivot shaft passing through said second holes of said parallel pivot sections and said pivot holes of said base seat, and another end of said second claw having a second end section with a sharp angle;

a resilient plate having a central straight section, a first bight section at one end of said central straight section, and a second bight section at another end of said central straight section, a free end of said first bight section engaging said first end section of said first claw, a free end of the second bight section engaging said second end section of said second claw; and

a stopper pin protruding through said stopper pin hole on each of said fixing boards of said base seat for stopping said resilient plate;

wherein, in a normal state of said retaining/fixing device, said first end section of said first claw engages said first tooth of said rack, while said second end section of said second claw engages said second tooth of said rack, said first tooth being spaced from said second tooth by a predetermined number of teeth; wherein, once said handle has been lifted, said first end section of said first claw pushes said rack, thereby outwardly moving said inner rod and thereby gradually moving said second end section of said second claw away from said first end section of said first claw to engage another tooth adjacent to said second tooth; and wherein, once said handle has been depressed, both said first and second claws are pushed by said resilient plate, thereby allowing said first end section of said first claw to approach said second end section of said second claw and engage another tooth adjacent to said first tooth, thereby forcing said first claw to advance by one pitch, thereby displacing said outer tube relative to said inner rod by repeatedly lifting and depressing said handle.

5,813,648

POSITION LOCKABLE SLIDE RAIL FOR MOTOR VEHICLE SEATS

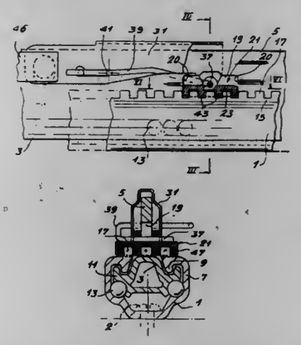
Pierre Moradell, St-Gregoire Du Vievre, and Dominique Folliot, Fiers, both of France, assignors to Bertrand Faure Equipments S.A., Boulogne Cedex, France

Filed Jan. 31, 1996, Ser. No. 596,388

Claims priority, application France, Feb. 3, 1995, 95 01414

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—424 **18 Claims**



1. Slide rail for a vehicle seat, comprising a female section in the shape of a U, having two flanges, and a male section sliding lengthwise between said flanges in said female section, and a lock for longitudinally locking the male section on the female section, wherein the female section comprises two rows of teeth, provided on each one of its flanges, respectively, said lock is connected, in the longitudinal direction, to the male section and includes longitudinal locking means arranged so as to cooperate in a locked position, with teeth of said two rows of teeth, for preventing a relative longitudinal movement of the male and female sections, and side retaining means formed in the lock, provided so as to trap, in said locked position, the female section flange edges, in order to keep said flanges from moving apart.

5,813,649

ENERGY-ABSORBING DEFORMABLE BRACKET

Leslie D. Peterson; Charles N. Whitaker, both of Phoenix, and John A. DiPalma, Gilbert, all of Ariz., assignors to Simula, Inc., Phoenix, Ariz.

Filed Mar. 13, 1996, Ser. No. 614,603

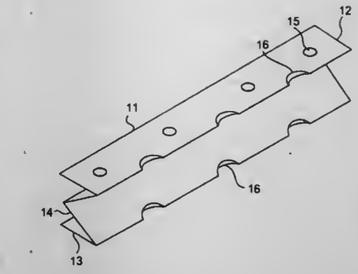
Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—618 **40 Claims**

1. An energy-absorbing bracket formed from a unitary metal sheet comprising:

(a) an upper flat section, said upper flat section having a first edge;

(b) a lower flat section parallel to the upper flat section, said lower flat section having a first edge;



(c) a first flat slanting section having a first edge and a second edge, wherein the first edge of the first slanting section is joined to the first edge of the upper flat section forming a common edge between the upper flat section and the first flat slanting section;

(d) a second flat slanting section having a first edge and a second edge, wherein the second edge of the first slanting section is joined to the first edge of the second slanting section, and wherein the second edge of the second slanting section is joined to the first edge of the lower flat section, forming a common edge between the first flat slanting section and the second flat slanting section and a common edge between the second flat slanting section and the lower flat section;

(e) means for attaching the lower flat section to a mounting platform; and

(f) means for attaching the upper flat section to a seat, wherein the bracket exhibits roughly constant load deformation when subjected to a load in the vertical direction above a predetermined threshold value such that, above the predetermined threshold value, the load in the vertical direction required to further deform the bracket is roughly constant until the bracket deformation is at a maximum.

5,813,650

ASEISMIC SUPPORT STRUCTURE

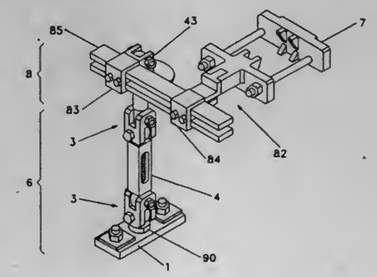
Takeshi Tsukamoto, Ohtsu; Hiroshi Suzuki, Ohmihachiman; Akira Suzuki, Ohmihachiman, and Katsushi Tanaka, Ohmihachiman, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 570,789, Dec. 12, 1995. This application Oct. 2, 1996, Ser. No. 725,150

Claims priority, application Japan, Mar. 2, 1995, 7-042747; Oct. 2, 1995, 7-254826; Feb. 19, 1996, 8-030211

Int. Cl.[6] E04H *9/02*

U.S. Cl. 248—638 **6 Claims**



1. An aseismic support structure having a first end secured on a fixed floor and a second end connected to a subject structure placed on a floating floor, said aseismic support structure comprising:

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a toggle bar having a first universal joint at its first end and a second universal joint at its second end, said first and second universal joints allowing the toggle bar to rotate horizontally around an axis perpendicular to said fixed floor and to rotate vertically around an axis parallel to said fixed floor;

an attachment section connected to said first universal joint by said second universal joint at one end, and having a third universal joint at another end, said attachment section position horizontal to said fixed floor and being constrained to said floating floor;

a cantilever connected to said attachment section by said third universal joint at one end, and having a fourth universal joint at another end, said cantilever extending substantially parallel to said fixed floor; and

a mounting section connected to said cantilever through said fourth universal joint, said subject structure being secured on said mounting section.

5,813,651

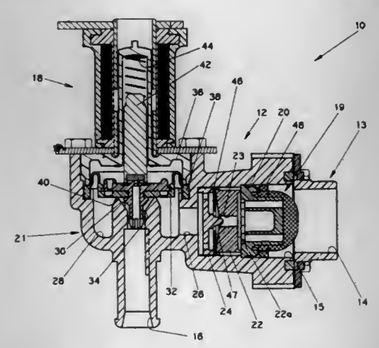
Patent Not Issued For This Number

5,813,652

APPARATUS FOR SUPPRESSING NOISE GENERATED BY A FLOW OF WATER THROUGH A WATER VALVE

James William Richmond, Hamilton County, and Michael R. DuHack, Marion County, both of Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 22, 1996, Ser. No. 735,357
Int. Cl.[6] F16K *47/14;31/40*
U.S. Cl. 251—127 **24 Claims**



5. A water valve assembly, comprising:

a valve body having an interior sidewall;

a retainer including a base flange having a peripheral edge which contacts said interior sidewall of said valve body, and a fluid channel through which a flow of water advances, said fluid channel being spaced apart from said peripheral edge;

a flow control member having a central passage through which said flow of water advances, said central passage of said flow control member being offset from said fluid channel of said retainer; and

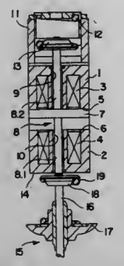
a suppresser having a hole defined therein through which said flow of water advances, said hole of said suppresser being offset from said central passage of said flow control member.

5,813,653

ELECTROMAGNETICALLY CONTROLLED REGULATOR

Thomas Esch; Martin Pischinger, both of Aachen, and Michael Schebitz, Eschweiler, all of Germany, assignors to FEV Motorentechnik GmbH & Co. KG, Aachen, Germany

PCT No. PCT/EP95/04970, § 371 Date Nov. 4, 1996, § 102(e) Date Nov. 4, 1996, PCT Pub. No. WO96/19643, PCT Pub. Date Jun. 27, 1996
PCT Filed Dec. 15, 1995, Ser. No. 696,979
Claims priority, application Germany, Dec. 21, 1994, 94 20 463 U
Int. Cl.[6] F16K *31/06*
U.S. Cl. 251—129.1 **7 Claims**



5. An electromagnetic actuator comprising

(a) a first electromagnet having a first pole face and an end face remote from said first pole face;

(b) a second electromagnet having a second pole face; said second electromagnet being spaced from said first electromagnet, and said first and second pole faces being oriented toward one another; one of said first and second electromagnets being displaceable relative to the other of said first and second electromagnets for varying a distance between said first and second pole faces;

(c) an armature arranged for reciprocating motion between said pole faces;

(d) a first spring for urging said armature away from said first pole face towards said second pole face;

(e) a second spring for urging said armature away from said second pole face towards said first pole face; said first and second springs acting oppositely such that in a de-energized state of said first and second electromagnets said armature being held by said first and second springs in an intermediate position between said first and second pole faces; and

(f) an adjusting device for displacing said one electromagnet into an adjusted position for varying said distance between said first and second pole faces.

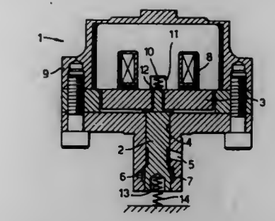
5,813,654

ELECTRICALLY OPERATED TRIGGER VALVE FOR FUEL INJECTION PUMP

Daniel Jeremy Hopley, Gillingham, England, assignor to Lucas Industries, Solihull, United Kingdom

Filed Apr. 24, 1997, Ser. No. 842,440
Claims priority, application United Kingdom, Apr. 26, 1996, 9608703
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.02 **11 Claims**

1. A valve for a fuel injection system comprising a valve member, an armature secured to the valve member, a stator coil for attracting the armature and valve member to move the valve from its open configuration to a closed configuration, and an opening spring which acts between an abutment surface and a spring seat provided on the valve member and armature assembly when the valve is in its closed configuration to bias the valve member and armature assembly towards the open configuration of the valve, wherein the free length of the opening spring is less than the



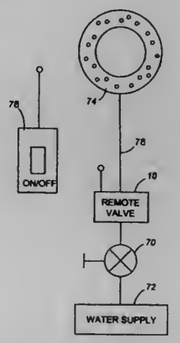
spacing between the abutment surface and the spring seat when the valve member and armature assembly are in the position corresponding to the valve being fully open so that the spring does not resist initial movement of the valve member and armature assembly away from the position corresponding to the fully open configuration of the valve.

5,813,655

REMOTE-CONTROL ON/OFF VALVE

Gordon A. Pinchott, 3515 Corbridge La., Rockford, Ill. 61107; Richard A. Nielsen, 216 7th St., Rockford, Ill. 61104, and John W. Rosenbloom, 2118 Oaklawn Ave., Rockford, Ill. 61107

Filed Oct. 11, 1996, Ser. No. 728,758
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.04 **17 Claims**



1. A remote-control on/off valve powered by a low-power local electrical energy source comprising: a valve member having open and closed positions disposed in a main conduit;

a water-powered motor in a parallel flow path which is in parallel with the main conduit, the water-powered motor being coupled to the valve member for driving the valve member between an open position and a closed position;

a receiver powered by the local electrical power source for receiving wirelessly transmitted control signals; and

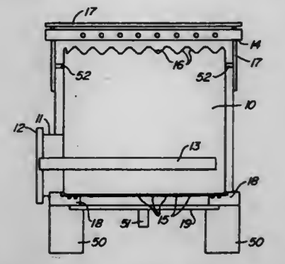
a pilot device powered by the local electrical power source and connected to the receiver for initiating flow through the parallel flow path to activate the water-powered motor upon reception of a control signal by the receiver, and to terminate said flow to the water-powered motor when a subsequent open or closed position is reached.

5,813,656

MODULAR DUMP VALVE ASSEMBLY IN A SEMICONDUCTOR BATH SYSTEM

Henry R. Miranda, 2244 Wellington Dr., Milpitas, Calif. 95035

Filed Feb. 7, 1996, Ser. No. 598,048
Int. Cl.[6] F16K *3/122*
U.S. Cl. 251—144 **20 Claims**



1. In a semiconductor bath system having a tank, a dump valve assembly comprising:

a drain at a bottom of said tank, said drain having an end and a flange around said end;

a cap having a base and a side, said side having an inward protrusion and being dimensioned and sufficiently elastomeric so that said cap can be fitted over said drain with said inward protrusion engaging said flange and can be removed from said drain by disengaging said protrusion from said flange;

a plate having a surface to contact said end of said drain to seal said drain opening; and

an actuator connected to said cap and said plate, said actuator driving said plate away from said cap base to place said plate surface against said drain end and to drive said plate toward said cap base to remove said plate surface from said drain end.

5,813,657

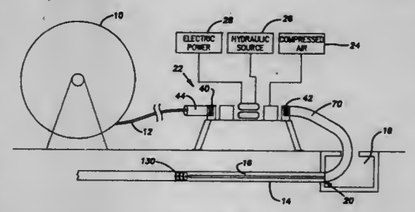
Patent Not Issued For This Number

5,813,658

CABLE FEEDING APPARATUS

Gerald A. Kaminski, Olmsted Township; Dennis B. Laska, Sheffield Lake; Joseph V. Negowski, and Robert C. Brod, both of Lorrain, all of Ohio, assignors to Arnco Corporation, Elyria, Ohio

Continuation of Ser. No. 344,447, Nov. 23, 1994, abandoned. This application Oct. 17, 1996, Ser. No. 734,384
Int. Cl.[6] B66F *3/24*
U.S. Cl. 254—134.4 **27 Claims**



1. An apparatus for installing cable in a tubular conduit, comprising:

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a driver adapted to engage the cable for applying an axial compressive force on the cable to propel the cable forwardly into the conduit; and

a sensor operatively connected to the conduit downstream of the driver for constantly measuring axial force applied to the conduit by the cable moving therethrough to indicate axial compressive loads applied to the cable by the driver, the sensor measuring the axial force on the conduit while the cable is propelled in an axial direction regardless of the deflection of the cable at the point of measurement, the sensor being connected to control the driver in response to a sensed force whereby limits of axial compressive loads on the cable may be set to protect the cable from excessive axial compressive loads before the cable is damaged but while it is still moving in an axial direction.

5,813,659

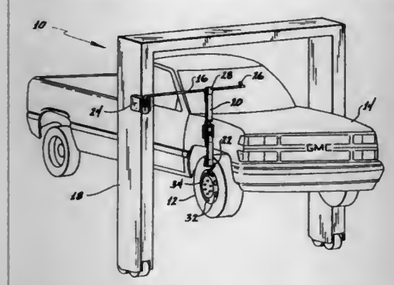
MANUAL HOIST FOR USE BY AUTO MECHANICS

Timothy Heidle, 956 Parker Rd., Hamburg, N.Y. 14075

Filed Feb. 21, 1997, Ser. No. 804,011

Int. Cl.[6] B66D *1/00*

U.S. Cl. 254—334 **8 Claims**



1. A manual hoist for use by auto mechanics to remove and install a wheel on a vehicle, comprising:

a vertical frame;

a cantilever arm pivotally secured to said frame and supported at one end only by said frame

a strap having a first end and a second end, said first end slidingly engaging said cantilever arm; and,

a fastener secured to said second end of said strap for use in attaching said strap to said wheel.

5,813,660

Patent Not Issued For This Number

5,813,661

ELECTROMAGNETIC LIFT APPARATUS

Ricky Mordecai Vann, P.O. Box 88, Loganville, Ga. 30249

Filed Feb. 19, 1997, Ser. No. 800,970

Int. Cl.[6] B60S *9/02*

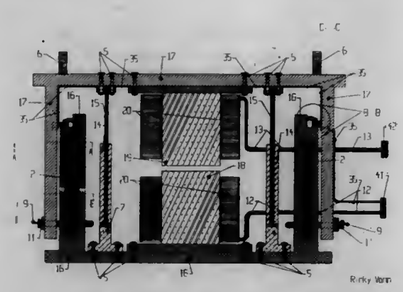
U.S. Cl. 254—418 **2 Claims**

1. A vehicle mounted electromagnetic jack system comprising:

an electromagnetically operated jack having inner and outer body sections;

a substantially flat base having molded neoprene padding for a firm grip of virtually any ground surface;

a group of mounting studs affixed to the top of the outerbody section, said mounting studs being securable to underside of the vehicle;



a vertical plunger moveable in a coaxial socket member, affixed to the top underside of the outerbody section and the floor of the innerbody section, for the purpose of smooth and gradual extension and retraction of body sections of the vehicle mounted electromagnetic jack system of the present invention as pertains to making or breaking the electric circuit of said jack;

a configuration of guide and shaft for smooth and gradual extension and retraction of connecting body sections of the vehicle mounted electromagnetic jack system of the present invention, as pertains to a veering to left or right of the confronting magnetic poles of like polarity;

an internal locking device which effectively locks connecting body sections of the vehicle mounted electromagnetic jack system of the present invention in the retracted position, while, but not limited to, the cessation of current to said body sections;

an external locking device which effectively locks connecting body sections of the vehicle mounted electromagnetic jack system of the present invention in either extension or retraction position, while, but not limited to, the cessation of current to said jack;

a frame which comprises a configuration of guide and rib for smooth extension or retraction of connecting body sections of the vehicle mounted electromagnetic jack system of the present invention;

a dual power supply system whereby, a primary power supply supplies current to a Upper Electromagnets, and a secondary power supply supplies current to a Lower Electromagnets, or any combination thereof, of the vehicle mounted electromagnetic jack system of the present invention;

an internal motorized locking device of, but not limited to, reversible means, whereby operation of said locking device works in conjunction with, but not limited to, the operation of the electromagnets of the vehicle mounted electromagnetic jack system of the present invention;

an innerbody wall and outerbody wall forged of carbon impregnated Aluminum for the purpose of forming a conductive enclosure which shields the vehicle mounted electromagnetic jack system of the present invention from ambient broadband electromagnetic interference;

a safety device whereby connection is made from the vehicle ignition switch to the power supply control circuit of the vehicle mounted electromagnetic jack system of the present invention, to prevent operation of said present invention while the vehicle is engaged in any motion gear.

5,813,662

PORTABLE FENCING SYSTEM

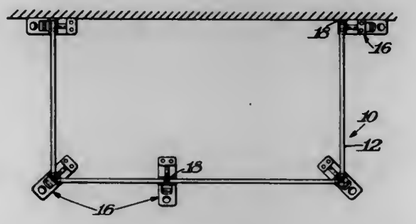
Marinus Johannes Langkruis, Beamsville, Canada, assignor to Cramaro Tarpaulin Systems, Inc., Canada

Filed Aug. 18, 1997, Ser. No. 912,383

Int. Cl.[6] E04H *17/18*

U.S. Cl. 256—25 **16 Claims**

1. In a portable fencing system having a plurality of fence sections, each of said fence sections having a side wall portion and



at least one foot extending downwardly below said wall portion, a plurality of base blocks, each of said base blocks having at least one longitudinal hole exposed on its upper surface, and said foot of one of said fence sections being inserted in said hole of one of said base blocks, the improvement being in that at least a portion of said base block is made of an outer skin to form a hollow chamber, a heavy filler material being in said hollow chamber to increase the weight of said base block for adding stability to said base block and to said fence sections and to maintain said base block intact in the event of said base block being dropped, including handles on said block, said handles comprising a first handle located remote from said chamber and a second handle located directly above said chamber, said block having an external depression in said upper surface directly above said chamber, and said second handle being located in said depression.

5,813,663

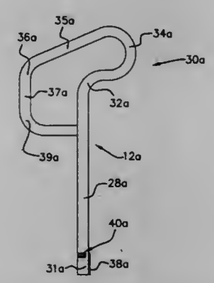
RAILING SYSTEM FOR TELESCOPIC SEATING

Daniel R. Victor, Kalamazoo; Stanley W. McKay, Richland; Melvin J. Guiles, Casnovia, and Kenneth A. Ahrens, Schoolcraft, all of Mich., assignors to Interkal, Inc., Kalamazoo, Mich.

Filed Aug. 20, 1996, Ser. No. 704,493

Int. Cl.[6] E04H *17/00*

U.S. Cl. 256—59 **8 Claims**



1. A hand rail system for a telescopic seating assembly comprising:

at least one independently supported upright,

said upright having an elongated base segment and a curved upper section,

said base segment having attachment means for removably attaching said upright to said seating assembly,

said curved upper section being a continuous extension of said base segment and including a set of bent portions extending from said base segment, each of said bent portions being bent so as to define an included angle, said set of bent portions having a net sum of included angles of said bent portions in said set which is at least about 270 degrees, said set of bent portions including four bent portions including:

a) a first bent portion extending from said base segment and having an included angle of about 90 degrees and extending in a first clockwise direction, and

b) a second bent portion extending of said first bent portion and having an included angle of about 204 degrees and extending in a counter-clockwise direction opposite to said first clockwise direction, and

c) a third bent portion extending of said second bent portion and having an included angle of about 66 degrees and extending in said counter-clockwise direction, and

d) a forth bent portion extending from said third bent portion and having an included angle of about 90 degrees in said counter-clockwise direction.

5,813,664

BACK-END CAFACITOR WITH HIGH UNIT CAPACITANCE

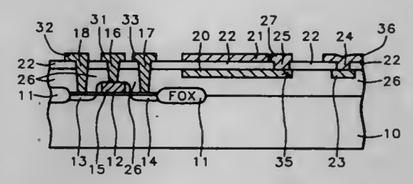
Yang Pan, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Ltd., Singapore, Singapore

Division of Ser. No. 545,413, Oct. 19, 1995, Pat. No. 5,571,746.

This application Jul. 26, 1996, Ser. No. 686,785

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 257—303 **11 Claims**



1. A capacitor structure, comprising:

a semiconductor substrate having devices formed therein and a planarized layer of interlevel dielectric formed thereon;

a bottom capacitor plate trench region, a bottom capacitor contact trench region, and a number of bond pad trench regions formed in said layer of interlevel dielectric;

a bottom capacitor plate formed by filling said bottom capacitor trench region with a first conductor material;

a bottom capacitor contact formed by filling said bottom capacitor contact trench with said first conductor material;

a number of bond pads formed by filing said bond pad trench regions with said first conductor material;

a layer of capacitor dielectric formed over said bottom capacitor plate, said bottom capacitor contact, said bond pads, and said layer of interlevel dielectric;

a bottom capacitor contact hole and a number of bond pad contact holes formed in said capacitor dielectric;

a number of device contact holes formed in said capacitor dielectric and said interlevel dielectric;

a second conductor material filling said bond pad contact holes, said bottom capacitor contact hole, and said device contact holes;

a layer of third conductor material formed over said capacitor dielectric, said bottom capacitor contact hole, said bond pad contact holes, and said device contact holes; and

a top capacitor plate and a top electrode pattern formed in said layer of third conductor material.

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5,813,665

FLUID-FILLED CYLINDRICAL ELASTIC MOUNT INCLUDING SYNTHETIC RESIN INTERMEDIATE SLEEVE HAVING INTEGRALLY FORMED STOPPERS

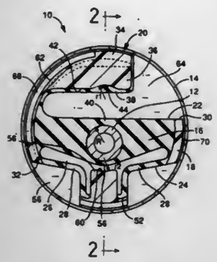
Ryouji Kanda, Komaki, Japan, assignor to Tokai Rubber Technologies, Ltd., Japan

Filed Sep. 13, 1996, Ser. No. 715,389

Claims priority, application Japan, Sep. 29, 1995, 7-252631

Int. Cl.[6] F16F *9/00*

U.S. Cl. 267—219 **10 Claims**



1. A fluid-filled cylindrical elastic mount including (a) a center shaft member, (b) an intermediate sleeve member disposed radially outwardly of said center shaft member and having a first and a second window, (c) a generally annular elastic body interposed between said center shaft member and said intermediate sleeve member for elastically connecting said center shaft member and said intermediate sleeve member, said elastic body having a first pocket and a second pocket formed at respective circumferential positions thereof that are opposed to each other in a diametric direction thereof, said first and second pockets being open on an outer circumferential surface of said intermediate sleeve member through said first and second windows, respectively, (d) an outer sleeve member fitted on said intermediate sleeve member so as to close said first and second windows, and cooperating with said first pocket to define a pressure-receiving chamber which is filled with a non-compressible fluid and which receives a vibrational load in said diametric direction, (e) a flexible diaphragm cooperating with said second pocket to define an equilibrium chamber which is filled with said fluid and whose volume is variable, and (f) means for defining an orifice passage for fluid communication between said pressure-receiving and said equilibrium chambers, and wherein said elastic body has a void formed through a portion thereof between said center shaft member and said equilibrium chamber, over an entire axial length of said elastic body, wherein an improvement comprises:

said intermediate sleeve member being made of a synthetic resin, and including an arcuate portion which extends in a circumferential direction of said intermediate sleeve member, from one of opposite ends of said first pocket which are opposed to each other in said circumferential direction, toward the other of said opposite ends, said arcuate portion defining one of opposite edges of an opening of said first window which corresponds to said one end of said first pocket;

said arcuate portion including a first stopper formed as an integral part thereof, said first stopper extending from an inner surface of said arcuate portion into said pressure-receiving chamber in said diametric direction and being spaced from said center shaft member by a first predetermined distance in said diametric direction;

said intermediate sleeve member further including a bridging portion which extends in an axial direction of said intermediate sleeve member between axial opposite edges of an opening of said second window, said bridging portion being located at an intermediate portion of said second pocket as seen in said circumferential direction of said intermediate sleeve member, and being inwardly spaced apart from said outer sleeve member in said diametric direction; and

said bridging portion including a second stopper formed as an integral part thereof, said second stopper extending from an inner surface of said bridging portion into said void in said diametric direction and being spaced from said center shaft member by a second predetermined distance in said diametric direction, said first and second stoppers being disposed on opposite sides of said center shaft member as seen in said diametric direction.

5,813,666

CLAMPING DEVICE WITH A MECHANICAL FORCE AMPLIFIER

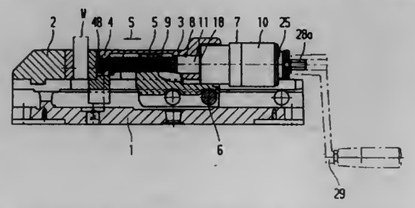
Heinrich Berchtold, Nänikon, Switzerland, assignor to Gressel AG, Aadorf, Switzerland

Filed Mar. 19, 1997, Ser. No. 821,800

Claims priority, application Germany, Apr. 18, 1996, 196 15 335.2

Int. Cl.[6] B25B *1/06*

U.S. Cl. 269—225 **10 Claims**



1. A clamping device with a mechanical force amplifier comprising:

a fixed jaw and a clamping slide with a clamping jaw located adjacent said fixed jaw, said clamping slide and said clamping jaw configured to move relative to said fixed jaw;

a stationary nut;

a threaded spindle which is coupled to said stationary nut to move against said clamping slide;

an amplifier housing having a cylindrical shape and arranged coaxially with said spindle and coupled for rotation to said spindle, said housing having a longitudinally extending axis, a front end located adjacent said spindle, wherein a movable thrust element is located at the front end to bear against said clamping slide;

a first clamping member disposed in said housing, said first clamping member being axially slidable in said housing and connected to said housing to rotate in unison with said housing, said first clamping member being further positioned to act against said thrust element;

a second clamping member disposed in said housing and positioned to rotate within said housing, said second clamping member having a front side directed towards said first clamping member and a rear side opposite the front side;

a spring in said housing for moving said clamping members together;

a plurality of tightening pins disposed in said housing and positioned to extend between said clamping members wherein said tightening pins are positioned to move as a function of the rotation of second clamping member in said housing from a relaxed position wherein said tightening pins are axially offset from the housing axis to a clamping position wherein said tightening pins are extending approximately parallel to the housing axis, wherein as said tightening pins members move from the relaxed position to the clamping position, said clamping pins move said clamping members apart;

a thrust bearing in said housing for supporting said second clamping member; and

a drive shaft that extends coaxially through said housing and acts on said second clamping member to rotate said second clamping member, wherein:

a planetary gear is located between said drive shaft and said second clamping member, said planetary gear having a sun wheel disposed on said drive shaft, an annulus attached to said housing, planet wheels that extend between said sun gear and said annulus, wherein said planet wheels are rotatably mounted to bearing pins and said bearing pins are secured to the rear side of said second clamping member; and

a detent mechanism is provided between said housing and said second clamping member for restricting rotation of said second clamping member.

5,813,667

SHEET DELIVERY DEVICE

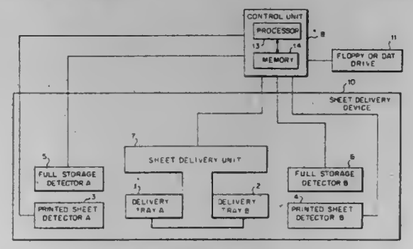
Tsuneo Imai, Ebina, and Akiko Shibuya, Sagamihara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 27, 1996, Ser. No. 757,940

Claims priority, application Japan, Nov. 30, 1995, 7-312496

Int. Cl.[6] B65H *39/02*

U.S. Cl. 270—58.14 **44 Claims**



1. A sheet delivery device comprising:

a plurality of delivery trays;

a delivery apparatus which delivers sheets to a selected delivery tray among the plurality of delivery trays; and

a selector which selects a delivery tray to which sheets are to be delivered among the plurality of delivery trays;

wherein said delivery apparatus includes discrimination apparatus which discriminates sheets so that the delivered sheets are discriminated from residual sheets when residual sheets are present in the selected delivery tray.

5,813,668

APPARATUS FOR CONVEYING AND STAGGERING ENVELOPE CONTENTS FOR REVIEW BY AN OPERATOR

Bernd Lund, Hamburg, Germany, assignor to Stielow GmbH & Co., Norderstedt, Germany

Continuation of Ser. No. 408,816, Mar. 23, 1995, abandoned. This application Jun. 5, 1997, Ser. No. 869,883

Claims priority, application Germany, Mar. 31, 1994, 44 11 245.9

Int. Cl.[6] B65H *5/00;29/68*

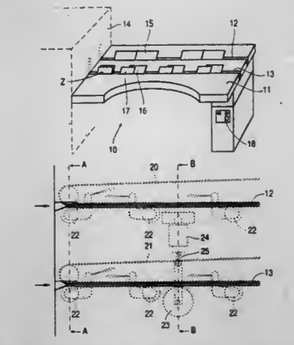
U.S. Cl. 271—2 **7 Claims**

1. Apparatus for processing envelope contents including overlapping first and second documents, comprising:

a conveyor, including a first conveyor belt, having a path along which the first and second documents move;

a delay apparatus positioned adjacent said conveyor and selectively pressed against one of the first and second documents to stagger the first and second documents so that a portion of each of the first and second documents is visible to an operator even if the first and second documents have the same length; and

a second conveyor belt positioned behind said first conveyor belt and forming a second conveying path, wherein said second



conveyor belt is substantially parallel to said first conveyor belt and conveys opened and emptied envelopes, so that the opened and emptied envelopes are visible to an operator.

5,813,669

PAPER SUPPLYING DEVICE AND A ROTOR THEREFOR

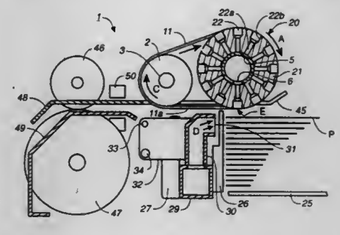
Yoshiyuki Horii, Kyoto, Japan, assignor to Horizon International, Inc., Shiga, Japan

Filed Jan. 7, 1997, Ser. No. 779,629

Claims priority, application Japan, Jun. 8, 1996, 8-182647; Jul. 2, 1996, 8-207545

Int. Cl.[6] B65H *5/08*

U.S. Cl. 271—12 **10 Claims**



1. A paper supplying device comprising:

a shelf for placing sheets of paper to be supplied thereon;

a suction rotor which is disposed above said shelf, said suction rotor having suction openings on outer peripheral surfaces and being adapted to suck up said paper placed on said shelf by sucking in air through said sucking openings;

a belt for causing said suction rotor to rotate and guiding said sucked paper forward tangentially with respect to said rotor;

a pulley for causing said belt to move around;

nozzles for blowing air therethrough toward front edge of said sucked paper; and

a friction pad having a coefficient of friction smaller than the coefficient of friction of said belt, said friction pad being adjustably disposed so as to be selectably either in contact or not in contact with said belt.

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5,813,670

DEVICE AND METHOD FOR RECEIVING, AND FOR LIFTING AND LOWERING A LATERALLY ALIGNABLE PILE BOARD

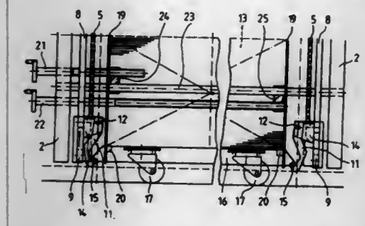
Burkhard Maass, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Aug. 10, 1992, Ser. No. 927,838

Claims priority, application Germany, Aug. 10, 1991, 41 26 542.4

Int. Cl.[6] B65H *1/26*

U.S. Cl. 271—157 **9 Claims**



1. A pile board receiver of a pile lifting device for lifting a feed pile disposed on a pile board comprising pivotal entrainer hooks having respective pivot points from which said entrainer hooks extend downwardly, means for vertically guiding said entrainer hooks, said entrainer hooks being pivotable in direction towards and away from a defined location in said receiver at which a pile board is receivable in said receiver, each of said entrainer hooks having a hook opening disposed below the respective pivot point and directed towards said location, the respective pivot point being located outside said defined location as extended vertically upward; each of said hooks being formed with a respective prong extending into a region of said receiver wherein a pile board receivable in said receiver is liftable therein, and wherein each entrainer hook has a curvature of the hook at the point of contact with said pile board, the curvature having a tangent extending upwards toward the middle of the sheet pile for urging said prong of the entrainer hook away from said defined location during downward movement of said entrainer hook.

5,813,671

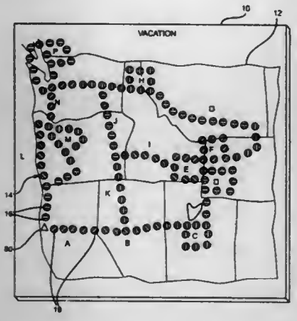
GAME APPARATUS AND METHOD OF PLAY

Patricia G. Barratt, 17 Yeager Dr., Lawrenceville, N.J. 08648

Filed Jul. 25, 1997, Ser. No. 900,443

Int. Cl.[6] A63F *3/04*

U.S. Cl. 273—251 **19 Claims**



1. A game apparatus having a vacation motif for play by a plurality of players, comprising:

a map showing a geographical location;

at least one game path extending between a beginning point and an end point on said map, wherein said at least game path includes a plurality of separate playing spaces arranged in different zones along said at least one game path;

a game piece for each of the players that is capable of being advanced along said playing spaces on said at least one game path;

a plurality of sets of activity cards, wherein each set of activity cards corresponds to one of said different zones along said at least one game path and describes a vacation activity that be performed in the geographical region represented by that zone on said map;

a plurality of trivia cards, each trivia card containing at least one trivia question and answer regarding the geographical region shown on said map;

a plurality of lodging sheets, each lodging sheet containing lodging sites and lodging costs for each zone along said at least one game path; and

a random selection device having a plurality of random selection indicia, said random selection device randomly selecting between at least three options wherein a slaver selects from said sets of activity cards, said trivia cards and said lodging sheets depending upon the random selection indicia produced by said random selection device.

5,813,672

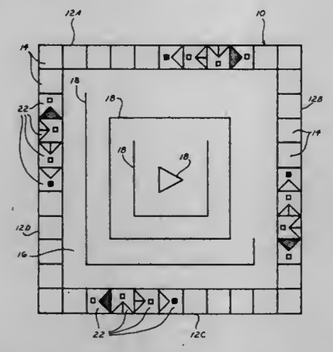
WORD PUZZLE AND GAME

Jewel O. Loud, Jr., 2518 Jackson St., La Marque, Tex. 77568

Filed Jul. 17, 1997, Ser. No. 896,130

Int. Cl.[6] A63F *3/00*

U.S. Cl. 273—272 **6 Claims**



1. A word puzzle game apparatus, an object of the word puzzle game apparatus being to decipher an encrypted word, the word puzzle game apparatus comprising:

a) a word puzzle card, having a plurality of sides, an outer periphery, and a geometric center;

b) a matrix of grid spaces, surrounding the outer periphery of the word puzzle card;

c) a display area located upon the word puzzle card, said display area framed by the matrix of grid spaces which surround the outer periphery of the word puzzle card; and

d) a plurality of letter characters, nested within the display area such that a letter character located in the outermost area of the display area is largest in size with respect to the other letter characters found within the display area, comprising a recognizable word to be deciphered by a player, and successive letter characters are placed in distinct zones progressively closer to the geometric center of the word puzzle card, with each successively inwardly approaching letter character smaller than the previously, more outwardly placed letter character, such that said letter characters never overlap.

5,813,673

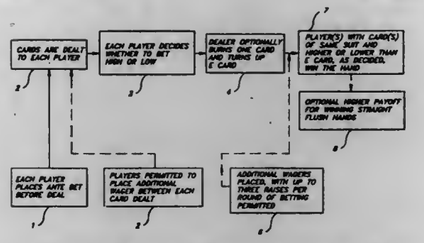
METHOD OF PLAYING A CARD GAME

Ronald Richardson, 2011 Shenandoah St., Los Angeles, Calif. 90034

Filed Mar. 18, 1997, Ser. No. 819,775

Int. Cl.[6] A63F *1/00*

U.S. Cl. 273—292 **20 Claims**



1. A method of playing a card game, comprising the following steps:

(a) providing at least one deck of cards having four suits of thirteen cards in each suit each card in a suit having a different rank;

(b) dealing a plurality of the cards face down alternatingly to each of the players of the game wherein each player is dealt a hand of cards;

(c) permitting each of the players to view each of their cards as they are dealt;

(d) after the hands are dealt and after the players have viewed their cards, turning a final card face up from the deck for all players to view, and;

(e) defining a winning card as a card having the same suit as the final card and having a predefined rank relative to the final card;

(f) comparing the cards of each player hand with the final face up card, with any card of a player hand which is of the same suit as the final face up card and which has said predefined rank relative to the final card, being a winning card for that player.

5,813,674

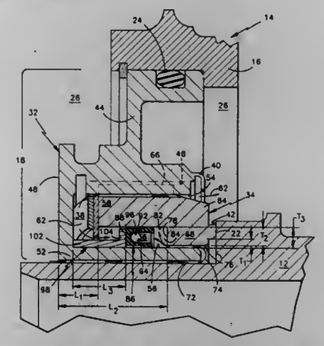
REVERSE PRESSURE TOLERANT SEAL MEANS

Paul A. Dickie, Newington; Kurtis D. Kleis, Granby, and Michael A. Mike, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 10, 1993, Ser. No. 105,093

Int. Cl.[6] F16J *15/34*

U.S. Cl. 277—395 **7 Claims**



1. A seal having an axis A which bounds a sealing plenum between a first region and a second region, the seal including a first sealing surface and a second sealing surface which extend circumferentially about the axis A and which are spaced radially to form the plenum, which comprises:

a first seal element which bounds a portion of the plenum, which extends circumferentially about the axis A and which has a C-shaped cross section, the seal element having a front which is closed and which faces the first region, a first sidewall extending from the front to the first sealing surface and a second sidewall extending from the front to the second sealing surface,

second seal element means disposed on the interior of the first seal element for urging the sidewalls apart leaving an opening therebetween and for urging the sidewalls apart into engagement with the sealing surfaces such that the first wall exerts a first sealing force against the first sealing surface and the second wall exerts a second sealing force against the second sealing surface, and

a third seal element extending circumferentially about the axis A and having a surface extending radially to engage the front of the first seal element, wherein the seal is adapted by the second seal element means to block the leakage of fluid from the first region by urging the sidewalls against the sealing surfaces and wherein the seal is adapted by the opening to allow pressurized fluid from the second region to exert a sealing force against the sidewalls to augment the sealing force from the second seal element means under operative conditions at which the pressure of the second region substantially exceeds the pressure of the first region, and wherein the third seal element positions the first seal element in the axial direction to resist the pressure force from the second region.

5,813,675

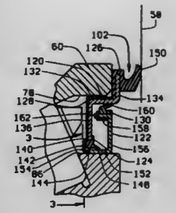
MULTIBARRIER SEAL

Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Continuation-in-part of Ser. No. 551,159, Oct. 31, 1995, abandoned. This application Oct. 15, 1996, Ser. No. 730,445

Int. Cl.[6] F16J *15/32*

U.S. Cl. 277—549 **22 Claims**



1. A seal for establishing dynamic fluid barriers around an axis of rotation, said seal comprising: an outer case having an axial wall and a radial wall directed inwardly from the axial wall; an inner case located generally within the outer case and having an axial wall and a radial wall directed outwardly from the axial wall; the radial wall of the inner case being spaced axially from the radial wall of the outer case; a first seal element carried by the radial wall of the outer case and establishing a fluid barrier with the axial wall of the inner case; a second seal element carried by the radial wall of the inner case and cooperating with the outer case to establish another fluid barrier that is located radially outwardly from the fluid barrier established by the first seal element, and a third seal element carried by the outer case and having a lip located radially outwardly from the second seal element, the lip of the third seal element projecting beyond the radial walls of the two cases and being configured to establish a dynamic fluid barrier with a surface located axially beyond the radial walls of the two cases.

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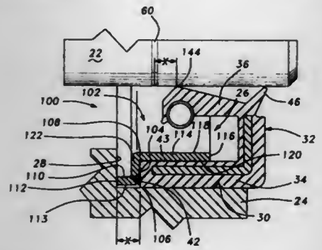
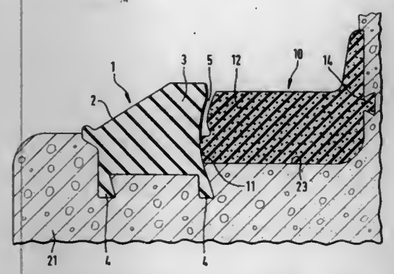
5,813,676
OIL SEAL EXTENDER
Joseph Antonini, Chicago, and Timothy J. Golema, Lyons, both of Ill., assignors to Dana Corporation, Toledo, Ohio
Filed Dec. 18, 1995, Ser. No. 573,823
Int. Cl.[6] F16J *15/32*
U.S. Cl. 277—551 **21 Claims**



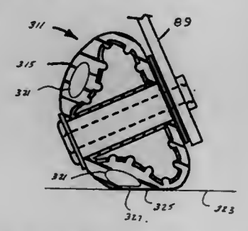
17. An oil seal sub-assembly comprising:
an annular oil seal circumscribing an axis, said oil seal having a radially outer section and a radially inner section; and
a one-piece annular oil seal extender, said extender including
a step having a radially outer edge and a radially inner edge,
an annular outer section extending axially away from said radially outer edge of said step and terminating at a base to define a predetermined axial distance for offsetting said seal from an original axial operational location to a new axial operational location defined by said predetermined axial distance, said annular outer section having a radially outermost periphery, and
an annular inner section extending axially away from said radially inner edge of said step in a direction opposite said annular outer section and terminating at a tip, said annular inner section having a radially innermost periphery and an outer periphery,
wherein said oil seal selectively contacts both said step and said inner annular section.

5,813,677
SEAL BETWEEN TWO INTERLOCKING COMPONENTS
Gerhard Preisendoerfer, Heusenstamm, Germany, assignor to Forsheda-Stefa GmbH, Germany
Continuation of Ser. No. 634,136, Apr. 19, 1996, abandoned, which is a continuation of Ser. No. 244,406, Oct. 31, 1994, abandoned. This application Jun. 10, 1997, Ser. No. 872,640
Claims priority, application Germany, Sep. 21, 1992, 92 12 666 U
Int. Cl.[6] F16L *21/025;* **M02G** *15/013*
U.S. Cl. 277—604 **6 Claims**



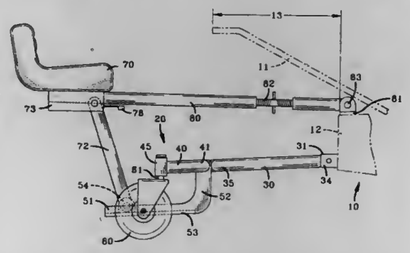
1. In combination; a sealing device between two telescopically insertable concrete parts, one of said insertable parts having a bell shaped socket and the other of said insertable parts having a spigot end to be received by said socket of the other of said insertable parts,
said sealing device being molded into the concrete forming said socket end of said insertable part and comprising a sliding seal having anchoring means for being fixed within said socket end of said insertable part;
said socket having an axially extending inner surface and a radially extending inner surface and said sliding seal being fixed in said socket to form an annular space extending between said sliding seal and said radially extending inner surface;
said sliding seal having a lip portion which is adapted to laterally yield into said annular space when said spigot end of one of said insertable parts is inserted into the socket of the other of said insertable parts whereby to form a lip seal between said insertable parts;
characterized in that a foamed rubber ring is mounted to said spigot end of said insertable part within said annular space;
said sliding seal and said foamed rubber ring each having a lower portion in engagement and an upper portion axially separated from one another by a gap defining the form of said lip portion of said sliding seal whereby upon compression forces being created by the insertion of said spigot end into said socket reaching a predetermined maximum said upper portion of said sliding seal moves into engagement with said upper portion of said foamed rubber ring to stiffen said foamed rubber ring and thereby converts said sliding seal from a lip seal to a compression seal.

5,813,678
INLINE SKATE AND SKATE WHEELS HAVING PNEUMATIC BRAKING ELEMENT
Duncan G. Robins, Woodland Hills, Calif., assignor to Jas. D. Easton, Inc., Van Nuys, Calif.
Continuation-in-part of Ser. No. 745,268, Nov. 8, 1996. This application May 23, 1997, Ser. No. 862,868
Int. Cl.[6] A63C *17/14;17/22*
U.S. Cl. 280—11.2 **2 Claims**



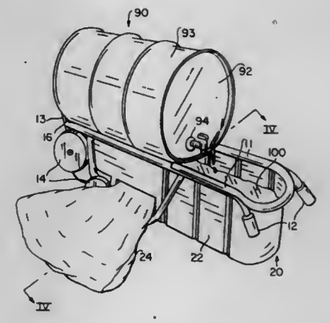
1. An inline roller skate wheel comprising:
a) a tread element and a braking element;
b) said tread element having a diameter of from 35 mm to 55 mm and an axial width less than 15 mm when the wheel is vertically disposed;
c) said tread element having a sleeve for receiving an axle and an outer skin of tough resilient material, the thickness of said outer skin being less than 10 mm;
d) said braking element being coaxial with said tread element and being formed as a laterally disposed axial extension of said tread element, the extension being sufficiently long for the braking element to meet an imaginary line extending upwardly at an angle of at least 60° with a horizontal skating surface and at a tangent to said tread element closest to said surface when said tread element is vertically disposed;
e) said braking element including an outer skin of tough resilient material which forms a braking surface, the thickness of said braking element outer skin being greater than 5 mm;
f) said braking element further including at least one air chamber located only within said axial extension and sufficiently close to the braking surface to accentuate distortion of the braking element when the wheel is tilted relative to the vertical disposition when the braking surface is engaged with the skating surface.

5,813,679
MOWER SULKY WITH AUTOMATIC SEAT ADJUSTMENT
Gerald Hobrath, Brunswick, Ohio, assignor to MTD Products Inc, Cleveland, Ohio
Continuation of Ser. No. 258,945, Jun. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 176,249, Jan. 3, 1994, abandoned. This application Nov. 4, 1996, Ser. No. 744,354
Int. Cl.[6] B62D *63/00*
U.S. Cl. 280—32.7 **19 Claims**



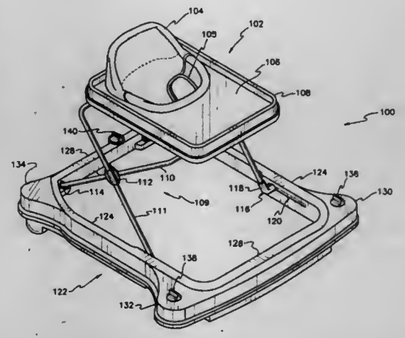
1. An improvement in a self propelled device having a fixed frame with a longitudinal axis, the improvement comprising a sulky stand, a wheel, means to connect said wheel to said sulky stand to support same for travel over the ground, a pivot frame, a horizontal "X" axis pivot means perpendicular to the longitudinal axis of the self propelled device to directly connect said pivot frame to the fixed frame of the self propelled device, said horizontal "X" axis pivot means allowing said pivot frame to move upwards and downwards in respect to the fixed frame of the self propelled device while minimizing longitudinal angular pivoting there between, means to connect said pivot frame to said sulky stand,
a seat, means to support said seat to said sulky stand for fore and aft movement in respect to said sulky stand,
a rod, means to connect said rod to the frame of the self propelled device, and means to connect said rod to said seat.

5,813,680
HAND TRUCK WITH EXPANDABLE SECONDARY CONTAINMENT RESERVOIR
Mark D. Shaw, Ponte Vedra Beach; J. Tad Heyman, and Laurence M. Bierce, both of Jacksonville, all of Fla., assignors to UltraTech International, Inc., Jacksonville, Fla.
Filed Sep. 23, 1996, Ser. No. 717,768
Int. Cl.[6] B62B *1/26*
U.S. Cl. 280—47.26 **10 Claims**



6. A combination hand truck and secondary containment device for the transportation and support in a generally horizontal dispensing position of a primary container for liquid, said hand truck comprising a generally rectangular wheeled frame having a nose plate and curved support members to support said primary liquid container and handles, said secondary containment device comprising means for the retention of liquid when said primary container is placed in a generally horizontal dispensing position, said secondary containment device comprising a bottom combined with side walls to form a liquid retaining reservoir and at least one port in said side walls, said side walls being connected to said frame of said hand truck, and expandable containment means joined in fluid connection to said at least one port, said expandable containment means comprising a liquid retaining bladder which occupies a small volume in the non-expanded state, but which is automatically expanded by the pressure of liquid flowing through said at least one port.

5,813,681
CHILD WALKER
Nathanael Saint, and Curtis Michael Hartenstine, both of Morgantown, Pa., assignors to Graco Children's Products Inc., Elverson, Pa.
Filed Apr. 17, 1996, Ser. No. 634,016
Int. Cl.[6] B62B *7/00*
U.S. Cl. 280—87.051 **35 Claims**



1. A rolling mechanism for moving over a floor surface and adapted for connection to a rectangular shaped base member of a child walker, the rolling mechanism consisting essentially of a first rolling support, a second rolling support and a third rolling support arranged in a triangular configuration wherein the first rolling support is disposed on a corner of the base member and the second rolling support is disposed centrally on a side of the base member, and wherein the first rolling support rolls easily in a plurality of directions and the second rolling support rolls more easily in one direction than another to cause the child walker to tend to move in a desired direction over the floor surface, at least one of the rolling supports being vertically fixed with respect to the base member such that when at least one of the first, second and third rolling supports passes an edge of the floor surface, the child walker tips toward the one rolling support and the base member contacts the floor surface to thereby inhibit the child walker from moving.

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5,813,682

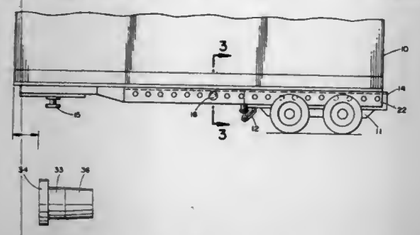
METHOD FOR EQUALIZING THE LOAD ONTO THE REAR WHEELS OF A TRUCK TRAILER WITH A TRAILER SLIDER STOP PIN

Duncan A. Stevens, 21186 Avalon Rd., Rocky River, Ohio 44116

Filed Jan. 25, 1996, Ser. No. 591,284

Int. Cl.[6] B62D *61/10*

U.S. Cl. 280—149.2 **3 Claims**



1. A method of adjusting wheel loading in a trailer adapted for use in a truck and trailer combination wherein the trailer comprises a trailer body having a pair of apertured channel members on the bottom thereof, a wheel bogie having a pair of apertured channel members on the top thereof which engage the channel members of the trailer body to permit relative sliding movement between the trailer body and a wheel bogie, and a locking mechanism having a pair of oppositely directed extendible and retractable locking pins for locking said trailer body channel members and said wheel bogie channel members when said pins are extended through apertures in said channel members; said method comprising the steps of:

assessing the wheel loading of the trailer;

setting the brake of the wheel bogie to preclude movement of the wheel bogie;

retracting the locking pins of the locking mechanism to permit relative movement between the trailer body and the wheel bogie;

inserting a trailer slider stop pin in an aperture of each trailer channel member at a position where the trailer body is to be stopped relative to the wheel bogie; and

moving the trailer body relative to the wheel bogie until movement of the trailer body is arrested by the trailer slider stop pins.

5,813,683

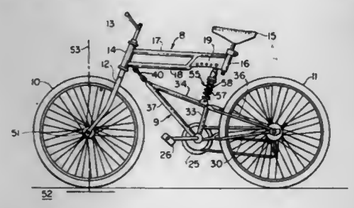
BICYCLE INCORPORATING BIFURCATED FRAME

Joseph E. Kulhawik, 10636 Landale St., North Hollywood, Calif. 91602, and Thomas E. Lee, 11661 Pendleton St., Sun Valley, Calif. 91352

Continuation-in-part of Ser. No. 311,047, Sep. 23, 1994, Pat. No. 5,498,014, which is a continuation-in-part of Ser. No. 78,531, Jun. 16, 1993, abandoned. This application Dec. 11, 1995, Ser. No. 570,720

Int. Cl.[6] B62K *3/02*

U.S. Cl. 280—275 **9 Claims**



1. A bicycle comprising:

(a) a front frame having a steering assembly coupled to a front wheel, a seat for holding a rider, upper and lower top tubes secured intermediate the seat and steering assembly, a first pivot flange mounted adjacent said steering assembly and extending rearwardly and downwardly therefrom, and a gusset having a top and bottom edge, the top edge being secured to the upper and lower top tubes and including an aligned plurality of spaced apertures disposed therethrough adjacent the bottom edge thereof;

(b) a rear frame having a crank and pedal assembly including a crank housing, said crank and pedal assembly being rotatably coupled to a rear wheel, first and second rear arms extending rearwardly from the crank housing and being disposed on either side of the rear wheel, a front stay secured to and extending upwardly from the crank housing, a pair of rear stays secured to said front stay and extending rearwardly, each of said rear stays being coupled to a respective one of said rear arms at the rear wheel, a center stay secured to the front stay and rear stays and a terminating flange secured to and extending forwardly from said center stay and a diagonal down tube extending forwardly and upwardly from the crank housing and being secured to said center stay and a second pivot flange axially extending forwardly from said diagonal down tube;

(c) pivotal coupling means for permitting said rear frame to pivot relative to said front frame, said pivotal coupling means being secured intermediate said first and second pivot flanges; and

(d) resilient means for damping the relative movement between the front frame and rear frame, said resilient means being coupled between the center stay of the rear frame and the gusset of said front frame.

5,813,684

FRONT WHEEL SUSPENSION FOR A MOTORCYCLE

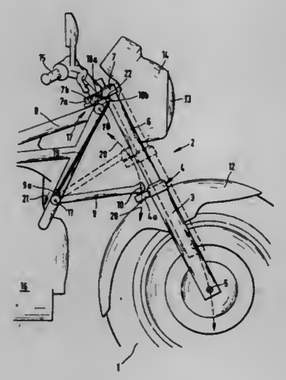
Guenter Baron, Olching, Germany, assignor to Bayersiche Motoren Werke Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1996, Ser. No. 607,314

Claims priority, application Germany, Feb. 24, 1995, 195 06 567.0

Int. Cl.[6] B62K *25/08*

U.S. Cl. 280—276 **11 Claims**



7. A motorcycle, comprising:

a body of the motorcycle; and

a front wheel suspension having a telescopic fork, said front wheel suspension including:

(a) slide pipes, which receive an axle shaft of a front wheel, are connected with one another via a lower fork bridge;

(b) vertical pipes arranged to be axially displaced in said slide pipes, said vertical pipes being held via a first ball joint in a swivellable manner on a steering head fixed to the body of the motorcycle;

(c) a longitudinal control arm applied to the lower fork bridge via a second ball joint, said longitudinal control arm being swivellably disposed on the body via a first hinge having an axis of rotation extending transversely with respect to a longitudinal axis through the motorcycle;

wherein said first ball joint holding said vertical pipes is swivellable via an additional hinge about an axis of rotation extending in parallel to the axis of rotation of said first hinge; and

(d) a steering strut having a first end section connected with said first ball joint in an articulated manner and an opposite end section connected with said longitudinal control arm in an articulated manner.

5,813,685

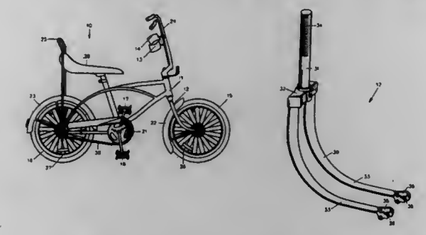
SPRINGER FORK LOW RIDER ASSEMBLY FOR A BICYCLE

Alexander LaRiviere, 702 S. First St., San Jose, Calif. 95113

Continuation-in-part of Ser. No. 11,610, Feb. 1, 1993, abandoned. This application Apr. 8, 1993, Ser. No. 45,747

Int. Cl.[6] B62K *21/02*

U.S. Cl. 280—279 **12 Claims**



1. An improvement in a bicycle fork having a steer tube, a spring assembly fixed to said steer tube, tubular furcations fixed to said spring assembly, said furcations having a wall thickness and having lower limbs, and struts extending away from said spring assembly, said improvement comprising:

said lower limbs of said furcations having a bend that extends said furcations in a forward direction and converts a long fork to a twenty inch fork.

5,813,686

Patent Not Issued For This Number

5,813,687

SPARE WHEEL ASSEMBLY FOR TRAILERS

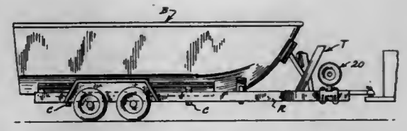
Alvin Loise Lay, Cantonement, and Charles E. Benedict, Tallahassee, both of Fla., assignors to EZ Way, Inc., Pensacola, Fla.

Filed Apr. 8, 1996, Ser. No. 629,137

Int. Cl.[6] B60P *3/10;* **B62D** *63/08;61/12*

U.S. Cl. 280—414.1 **19 Claims**

1. An auxiliary wheel assembly adapted to be selectively mounted to a frame member of a trailer in order to make the trailer roadworthy and wherein the frame member includes a bottom wall and at least one side wall, the auxiliary wheel assembly comprising:



a support member having upper and lower end portions and an elongated axis;

clamping means adapted to secure said support member to the frame member without adversely affecting the structural integrity of the frame member, said clamping means including a frame support portion, said frame support portion of said clamping means being generally L-shaped having a first portion extending generally parallel to said axis of said support member and adapted to engage the at least one side wall of the frame member and a second portion mounted to said upper end portion of said support member and extending generally Perpendicular to said axis and adapted to engage the bottom wall of the frame member, said clamping means further including at least one clamping plate opposing and spaced from said first portion of said frame support portion and fastener means adapted to extend exteriorly of the frame member for securing said clamping plate to said first portion of said frame support portion to thereby mount said auxiliary wheel assembly to the frame member;

a tire mounted to a wheel;

spindle means for connecting said wheel to a strut, said strut having at least one first opening therethrough, said support member including at least one second opening therethrough; and

a locking pin member releasably mounted through aligned first and second openings in said strut and said support means for selectively securing said strut relative to said support member.

5,813,688

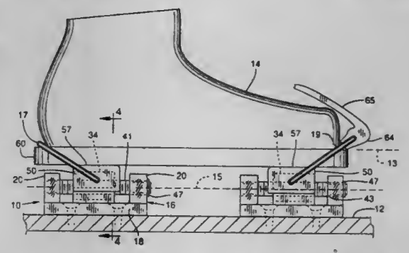
SNOWBOARD BINDING

Kib Dacklin, Salt Lake City, Utah, assignor to Steven Beck, Costa Mesa, Calif.

Filed Dec. 8, 1993, Ser. No. 164,213

Int. Cl.[6] A63C *9/08*

U.S. Cl. 280—607 **21 Claims**



1. A binding for mounting a boot on a snowboard, comprising:

a mounting frame attachable to the snowboard comprising a U-shaped member defining a base plate and a pair of longitudinally spaced apart upright support portions along a single rocker axis;

a rocker plate supported by the frame and rockably mounted between the upright support portions and spaced above said base plate for rocking movement about the rocker axis and having an upper plate surface for supporting the boot; and

a rocker regulator engaging the rocker plate to resist rocking movement of the rocker plate about the rocker axis wherein the rocker regulator comprises a pair of resilient blocks mounted on the base plate between the upright support portions and beneath opposite end portions of the rocker plate so

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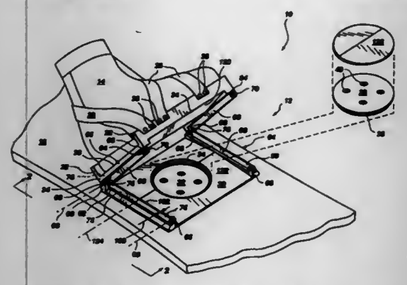
as to bias the rocker plate to a neutral position generally parallel to the base plate when the rocker plate is unloaded.

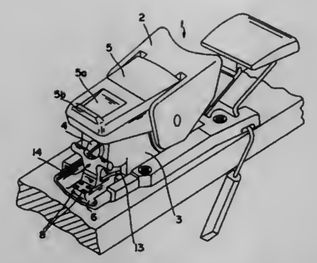
5,813,689
BINDING ASSEMBLY FOR A SNOW BOARD
Brian S. Mansure, Orem, Utah, assignor to Brigham Young University, Provo, Utah
Filed May 16, 1997, Ser. No. 857,414
Int. Cl.[6] A63C *9/02*
U.S. Cl. 280—607 **39 Claims**



1. A binding for securing a boot to a sport board, comprising:
a binding plate including means for attachment of the binding plate to the boot;
a first hinge assembly capable of being secured in connection with the board and being in connection with the binding plate; and
a second hinge assembly capable of being secured in connection with the board and being in connection with the binding plate, thereby permitting pivotal movement of the binding plate with respect to the board about a first axis of rotation between a home position, in which the binding plate is substantially coplanar with the board, and a first rotated position, and permitting pivotal movement of the binding plate with respect to the board about a second axis of rotation between the home position and a second rotated position,
the first and second hinge assemblies each including at least one hinge arm and hinge pins connecting the at least one hinge arm to the binding plate and the board, said hinge pins defining pivot locations for the first and second axes of rotation, the first and second hinge assemblies further configured such that the first and second axes of rotation are substantially parallel to the plane of the board, thereby allowing selective pivotal movement of the binding plate with respect to the sport board about the first or second axis of rotation.

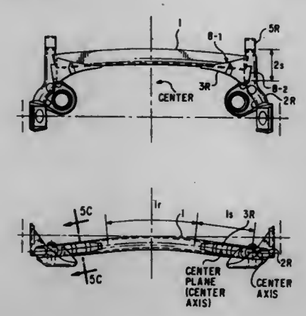
5,813,690
ELEMENT FOR HOLDING A BOOT IN POSITION ON A SKI
Vincent Dogat, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France
Filed Jun. 19, 1996, Ser. No. 667,035
Claims priority, application France, Jun. 22, 1995, 95 07694
Int. Cl.[6] A63C *9/084*
U.S. Cl. 280—634 **8 Claims**

1. An element for position retention of a boot on a sliding board, comprising a body movable along a slide-rail, a locking device carried by the body and adapted to immobilize the body along the slide-rail in a defined position, wherein said locking device has a rear extension which is attached to a flexible control mechanism which extends upward over a portion only of a height of the body, said control mechanism having a "T" shape incorporating a single central vertical member surmounted by a transverse bar with two



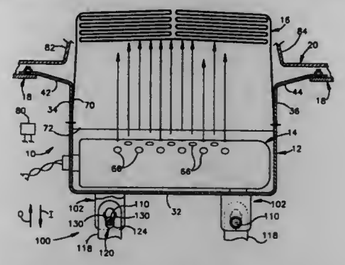
arms with free ends extending on each side of said central vertical members so as to permit engagement of each of said arms by a finger of a single hand of a user.

5,813,691
TWIST BEAM TYPE SUSPENSION HAVING A RIGID TWIST BEAM
Tetsuya Aoki, Düsseldorf, Germany; Yoji Uchida; Mamoru Sakamoto, both of Toyota, Japan; Toshiyasu Santo, Aichi-Ken, Japan; Tatsuzo Komiya, Okazaki, Japan, and Masaharu Obba, Aichi-Ken, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Mar. 19, 1996, Ser. No. 616,495
Claims priority, application Japan, Mar. 24, 1995, 7-065952; Oct. 12, 1995, 7-264301
Int. Cl.[6] B60G *21/05*
U.S. Cl. 280—689 **15 Claims**



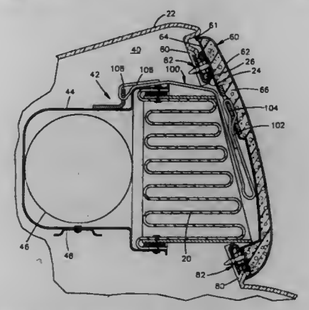
1. A twist beam suspension of a vehicle, comprising:
a pair of trailing arms each of which has a front end pivotally mounted on a body of said vehicle and a rear end rotatably supporting a wheel; and
a twist beam extending between said trailing arms in a side-to-side direction of said vehicle, opposite ends of said twist beam being connected to respective ones of the pair of trailing arms, said twist beam having a bent portion connecting to straight portions at opposite ends of said bent portion, said bent portion being defined by a single smooth curve projecting upwardly, a radius of curvature of said bent portion being minimum at a center of said twist beam.

5,813,692
AIR BAG MODULE
Ernst M. Faigle, Dryden; Tracy S. Sparks, Lapeer, and Xingyuan Sun, Rochester Hills, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Nov. 22, 1996, Ser. No. 755,286
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **21 Claims**



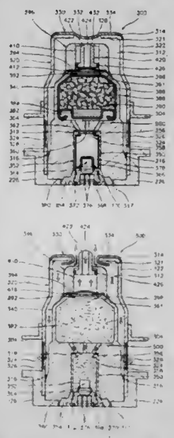
1. An apparatus for helping to protect an occupant of a vehicle, said apparatus comprising:
a container;
an inflatable vehicle occupant protection device connected with said container for helping to protect the occupant of the vehicle;
an inflator connected with said container for, upon actuation, providing inflation fluid to inflate said inflatable device;
means for supporting said container on a portion of the vehicle for movement in a first direction relative to the instrument panel in response to actuation of said inflator; and
damping means connected between said container and the vehicle portion for damping movement of said container in the first direction relative to the vehicle portion.

5,813,693
RELEASABLE ATTACHMENT FOR AIR BAG DEPLOYMENT DOOR
Gary G. Gordon, Southfield; Scott A. Kelley, Algonac, and Andrew J. Smydra, Rochester, all of Mich., assignors to TRW VechicleSafety Systems Inc., Lyndhurst, Ohio
Filed Feb. 26, 1996, Ser. No. 605,495
Int. Cl.[6] B06R *21/20*
U.S. Cl. 280—728.3 **16 Claims**



1. An apparatus for helping to protect a vehicle occupant, said apparatus comprising:
an inflatable vehicle occupant protection device mountable in a vehicle, said protection device being deployable, upon inflation, through a deployment opening in a vehicle part;
a cover for closing the deployment opening in the vehicle part prior to deployment of said protection device, said cover being movable away from the vehicle part upon deployment of said protection device; and
attachment means for releasably attaching said cover to the vehicle part, said attachment means comprising:
a clip attachable to one of said cover and the vehicle part, the one of said cover and the vehicle part having a mounting opening and a recess adjacent the mounting opening, said clip comprising a retaining portion biased to be received in the recess and inhibit removal of said clip from the one of said cover and the vehicle part and an opening for alignment with the mounting opening, said clip further including a resiliently deflectable portion; and
a stud being non-pivotally fixed to the other of the vehicle part and said cover, said stud being releasably connectable with said clip, said stud comprising a body extendable through the opening in said clip and the mounting opening;
said clip being movable relative to the mounting opening in the one of said cover and the vehicle part to compensate for relative misalignment among the opening in said clip, the mounting opening and said stud during attachment of said cover to the vehicle part.

5,813,694
HYBRID AIR BAG SYSTEM HAVING AN IMPROVED HYBRID INFLATOR
Jae-Ho Jeong, Seoul, Rep. of Korea, assignor to Daewoo Electronic Co., Ltd., Seoul, Rep. of Korea
Filed Aug. 27, 1996, Ser. No. 703,908
Claims priority, application Rep. of Korea, Aug. 31, 1995, 199527829
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—737 **30 Claims**



1. A hybrid air bag system for a motor vehicle, the hybrid air bag system comprising:
a first container defining a first internal cavity, said first container having a cover which is ruptured at a collision of the motor vehicle and a bottom plate, in which said bottom plate is positioned at a lower inner portion of said cover and is engaged with said cover;
an inflatable air bag for being unfolded by receiving a compressed gas and combustion products, said inflatable air bag being folded in said first internal cavity, having free ends which are secured between said cover and said bottom plate, and defining a second internal cavity between said bottom plate and said inflatable air bag; and
a hybrid inflator for generating the combustion products and for inflating said inflatable air bag when a collision sensing signal

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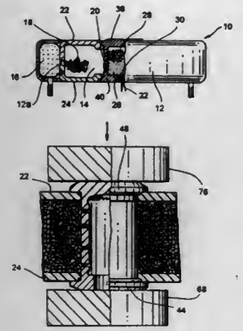
is generated at the collision of the motor vehicle, said hybrid inflator being mounted on said bottom plate in said second internal cavity and including a second container, said second container having a first steel wall integrally formed to define a first chamber which is filled with the compressed gas and is then sealed.

5,813,695

IGNITER POST FOR AIRBAG GAS GENERATOR

Peter O'Driscoll, Los Altos, and Glenn Sander, San Jose, both of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 17, 1996, Ser. No. 718,067
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—741 **14 Claims**



7. A non welded gas generator consisting essentially of:

a casing having a combustion chamber therein, said casing having a first side with a first opening and a second side with a second opening;

an igniter post traversing said casing from said first opening to said second opening, said igniter post having a substantially tubular body, said body having a plurality of holes extending from a hollow interior of said body to said combustion chamber;

a head on a first end of said igniter post, said head engaging said first side of said casing;

a transverse wall extending across said tubular body at a second end of said body opposite said first end;

a ductile rim on said second end of said body, said ductile rim being bent outwardly to engage said second side of said casing.

5,813,696

AIR BAG WITH TETHER

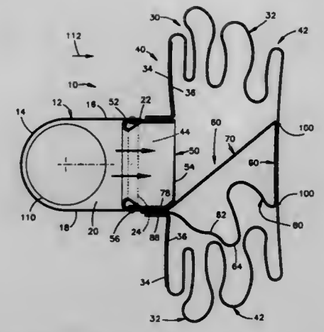
Bruce R. Hill, Bloomfield Hills, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Oct. 28, 1996, Ser. No. 738,472
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—743.2 **8 Claims**

1. A vehicle safety apparatus comprising:

an inflatable vehicle occupant protection device having a base portion and having a body portion connected with said base portion and inflatable in a direction away from said base portion into an inflated condition; and

an elongate tether for controlling inflation of said body portion of said inflatable device;



said tether having an intermediate portion which has a generally circular configuration and which is sewn to said body portion of said inflatable device with a circular stitching section;

said tether having first and second end portions sewn to said base portion of said inflatable device;

said tether having a generally rectangular shorter portion extending in a first direction from said intermediate portion of said tether, said shorter portion of said tether including said first end portion of said tether;

said tether having a generally rectangular longer portion extending in a second direction from said intermediate portion of said tether, said longer portion of said tether including said second end portion of said tether, said longer portion of said tether being wider than said shorter portion of said tether and thereby having a greater tensile strength than said shorter portion of said tether;

said inflatable device having a partially inflated condition in which said shorter portion of said tether is extended and resists movement of said body portion of said inflatable device away from said base portion, said longer portion of said tether being unextended when said inflatable device is in the partially inflated condition;

said shorter portion of said tether being rupturable under the force of said inflating inflatable device to enable movement of said inflatable device from the partially inflated condition to a fully inflated condition in which said longer portion of said tether is extended and resists movement of said body portion of said inflatable device away from said base portion.

5,813,697

FORKLIFT STABILIZING APPARATUS

J. Scott Bargenquast, Saukville; Terry A. Weber, Greenfield, and John R. Plate, Milwaukee, all of Wis., assignors to Trak International, Inc., Port Washington, Wis.

Continuation of Ser. No. 350,216, Dec. 5, 1994, Pat. No. 5,639,119. This application Mar. 3, 1997, Ser. No. 804,291
Int. Cl.[6] B60R *27/00*
U.S. Cl. 280—754 **17 Claims**

1. A vehicle including

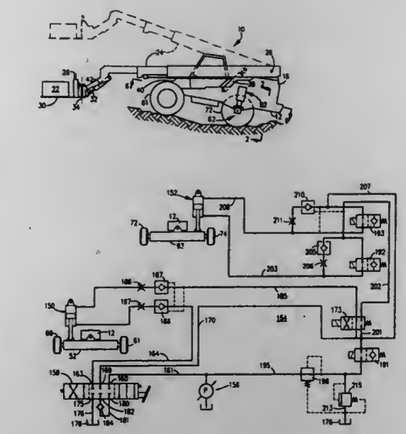
a frame,

a front axle supported at the opposite ends thereof by wheels and connected to said frame for shiftable movement relative thereto,

a rear axle supported at the opposite ends thereof by wheels and connected to said frame for shiftable movement relative thereto, and

a stabilizer apparatus including

a pressure source,



first and second fluid-actuated stabilizer assemblies connected respectively to said front and rear axles,

wherein in the absence of pressurization by said pressure source, one of said first and second stabilizer assemblies is locked against extension and contraction, and the other of said first and second stabilizer assemblies is free to extend and contract, and

a hydraulic circuit connected between said pressure source and said first and second fluid activated stabilizer assemblies and including

a flow controller operable between

a first mode wherein said pressure source is disconnected from said first and second stabilizer assemblies, whereby said one of said stabilizer assemblies is locked against extension and retraction, thereby locking said axle connected thereto against shifting movement relative to said frame, and whereby said other of said stabilizer assemblies is free to extend and retract, thereby permitting shifting movement relative to said frame of said axle connected thereto, and

a second mode wherein said pressure source is selectively connected to said first and second stabilizer assembles for selective pressurization thereof by said pressure source so as to selectively extend and retract said first and second stabilizer assemblies.

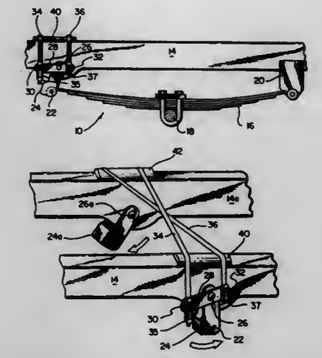
5,813,698

PAYLOAD DEPENDENT STABILIZER SYSTEM

Louis M. Spoto, Sleepy Hollow, and Kenneth H. Dorman, Carol Stream, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Oct. 2, 1996, Ser. No. 689,936
Int. Cl.[6] B62D *9/02*
U.S. Cl. 280—772 **8 Claims**

1. A stabilizer system for an automotive vehicle having a rear suspension including left and right shackles, each having a first end coupled at a first pivot point to one of a left and right frame member and a second end spaced from the first end and pivotally coupled to one end of a leaf spring, said stabilizer system comprising: first and second elongated arms, each of said arms being rigidly coupled to one of said shackles and extending transversely thereof; first and second elongate flexible means for tensionably linking said arms, the first elongate flexible means being operatively connected to and extending between the one end of the first



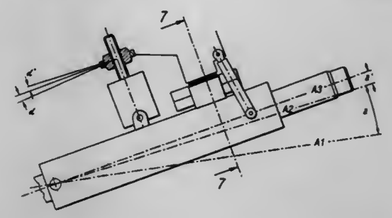
arm and the opposite end of the second arm, and the second elongate flexible means being operatively connected to and extending between the one end of the second arm and the opposite end of the first arm, each of said elongate flexible means passing over both of said frame members between its operative connections to the respective first and second arms.

5,813,699

STEERING DEVICE FOR MOTOR VEHICLES

Harald Donner, Meinerzhagen; Ralf Heinze, Lüdenscheid; Meinolf Kathol, Finnentrop, and Jörg Welschholz, Herscheid, all of Germany, assignors to Leopold Kostal GmbH & Co. KG, Germany

Filed Oct. 3, 1995, Ser. No. 538,366
Claims priority, application Germany, Oct. 10, 1994, 44 36 091.6
Int. Cl.[6] B62D *1/18*
U.S. Cl. 280—775 **26 Claims**



1. A steering device for motor vehicles having a steering column (1) at least partly surrounded by a casing tube (2), one end of the steering column being connected to a steering wheel and the other end being allocated to a steering gear, and which is positionable in an axial direction within a preset displacement range (a), comprising:

a positioning device (4) actuated by external force, the positioning device (4), when the motor vehicle is switched off, positioning a steering column (1) into an axial position (A3) lying outside the displacement range (a) so that a torsional force exerted on the steering column (1) via the steering wheel is not transmittable to the steering gear.

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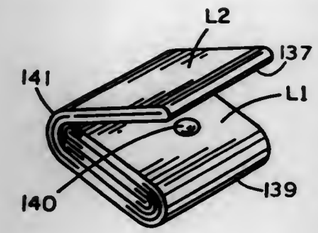
5,813,700
METHODS OF FOLDING OUTSERTS
Joseph M. Vijuk, 403 Royal Glen Ct., Oak Brook, Ill. 60521, and Robert Vijuk, 1061 Robey Ave., Downers Grove, Ill. 60516
Continuation-in-part of Ser. No. 324,350, Oct. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 264,181, Jun. 22, 1994, Pat. No. 5,458,374, which is a continuation of Ser. No. 37,294, Mar. 26, 1993, abandoned, Continuation-in-part of Ser. No. 264,181, Continuation of Ser. No. 37,294.
This application Jun. 19, 1995, Ser. No. 492,213
Int. Cl.[6] B42D *15/04;15/00*
U.S. Cl. 283—81 **10 Claims**



1. A method of folding a sheet having printed information thereon for use in the formation of an outsert for providing information to the user of a product, said method comprising the steps of:

(a) folding said sheet by making a plurality of first folds to form a first folded article, said first folds being parallel to each other and parallel to a first direction, said first folds being accordion-type folds;

(b) folding said first folded article in half by making a second fold in the middle of said first folded article to form a second folded article, said second fold being parallel to a second direction, said second direction being perpendicular to said first direction, said second folded article having a first end and a second end, said first end having no unfolded exterior sheet edges;

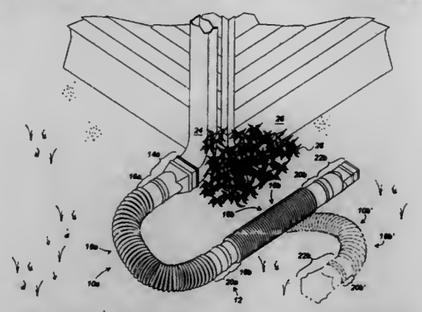
(c) folding said second folded article by making a third fold to form a third folded article, said third fold being parallel to said second direction and being made so that said second end of said second folded article is disposed between said first end of said second folded article and said third fold, said third folded article having a planar portion disposed between said second end of said second folded article and said third fold;

(d) folding said planar portion of said third folded article by making a fourth fold to form a fourth folded article, said fourth fold being parallel to said second direction and being made so that said third fold substantially coincides with said second end of said second folded article, said fourth folded article having a planar portion disposed between said third fold and said fourth fold;

(e) depositing an adhesive on said planar portion of said fourth folded article; and

(f) folding said fourth folded article by making a fifth fold to form a fifth folded article, said fifth fold being parallel to said second direction and being made so that said first end of said second folded article substantially coincides with said fourth fold and so that said fifth folded article has no unfolded exterior sheet edges which lie in a direction parallel to said second direction.

5,813,701
REPOSITIONABLE FLEXIBLE DOWNSPOUT EXTENSION
Christopher D. Noble, Matthews, N.C., assignor to Gutter World, Inc., Atlanta, Ga.
Filed Mar. 7, 1996, Ser. No. 610,588
Int. Cl.[6] F16L *41/00;11/06*
U.S. Cl. 285—4 **13 Claims**



1. An integrally molded, repositionable gutter downspout extension for connection to a rectangular cross-sectional end of a gutter downspout, comprising:

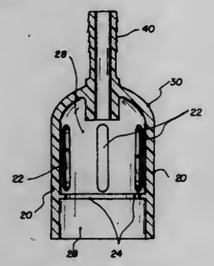
an elongate generally cylindrical body having first and second ends, said body comprising a plurality of collapsible corrugations, said collapsible corrugations comprising lockable annular members, each said lockable annular member comprising a static side and a movable side, that allow said body to extend, contract, bend, and lock into selectable lengths and angular positions;

first and second downspout connectors affixed at said first and second ends, respectively, said first and second downspout connectors being generally rectangular in cross-section, whereby the extension can be connected to said end of said gutter downspout;

a first means associated with said first end for locking the downspout extension to a mating locking means associated with a downspout accessory; and

a second means associated with said second end for locking the downspout extension to a mating locking means associated with a downspout accessory.

5,813,702
WATER SOFTENER DRAIN ADAPTOR SYSTEM
Harry William McGuire, 205 S. Smith St., Olds, Iowa 52647
Filed Dec. 9, 1996, Ser. No. 762,285
Int. Cl.[6] E03C *1/10*
U.S. Cl. 285—148.23 **12 Claims**



1. A water softener drain adapter comprising:

a tube having a first end, a lumen and a longitudinal axis; said lumen near said first end having a diameter formed for snugly coupling over a drain pipe of a sewage system for preventing the collection of water and materials between said tube and said drain pipe;

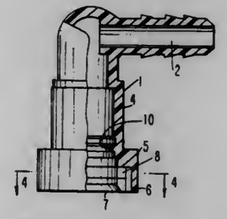
a cap secured to said tube opposite of said first end;

a tapered barb connector tube secured within said cap, said tapered barb having a duct therethrough, said barb connector projecting into said lumen of said tube to permit fluid communication between said lumen and said duct, said barb connector being for connecting to a drain hose of a water softener, wherein said tapered barb is coaxial with said longitudinal axis;

a plurality of air slots projecting into said tube substantially parallel to said longitudinal axis for preventing sewage from said sewage system from being siphoned back into said water softener; and

a rib secured within said lumen to said tube radially positioned with respect to said longitudinal axis and positioned a finite distance from said first end and below said air slots, said rib being for preventing said drain pipe from extending and covering said air slots.

5,813,703
CONNECTOR FOR HOSES
Antonio Carlos Reinholz, Sao Paulo, Brazil, assignor to Tampas Click Para Véiculos Indústria E Comércio Ltda., Sao Paulo, Brazil
Filed Feb. 26, 1997, Ser. No. 807,051
Claims priority, application Brazil, Feb. 26, 1996, 9600812-1
Int. Cl.[6] F16L *43/02*
U.S. Cl. 285—179 **11 Claims**



1. A connector for connecting a pair of hoses, comprising,

a unitary body including

a substantially cylindrical main section having a hollow interior and a substantially cylindrical outer surface,

a projection extending outward from said substantially cylindrical outer surface of said main section in a substantially perpendicular direction to said substantially cylindrical outer surface and connectable to a first hose, said projection having a hollow interior in flow communication with said interior of said main section,

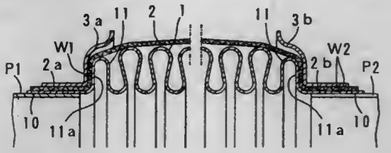
a first edge portion extending outward from said main section,

a second edge portion extending outward from said main section at a distance from said first edge portion to define a space therebetween, and

a rim defining an aperture through which a second hose is insertable into said interior of said main section; and

locking means arranged in said space between said first and second edge portions for locking the second hose in connection with said main section.

5,813,704
FLEXIBLE JOINT
Takahiko Naito, Kawaguchi, Japan, assignor to Sankei Giken Kogyo Kabushiki Kaisya, Tokyo, Japan
Filed Mar. 13, 1997, Ser. No. 816,885
Claims priority, application Japan, Mar. 15, 1996, 8-087548
Int. Cl.[6] F16L *55/02*
U.S. Cl. 285—226 **3 Claims**



1. A flexible joint comprising:

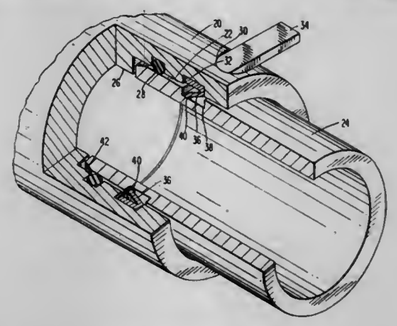
a bellows having an intermediate portion, with a wave-shaped cross-section, between first and second cylindrical end parts, wherein said intermediate portion has a ridge part with a lateral side surface at first and second ends adjacent to said first and second cylindrical end parts, respectively;

a cylindrical braid covering an outer periphery of said bellows;

first and second ring-shaped protectors fittingly held on a portion of an outer periphery of said cylindrical braid at first and second ends of said braid, respectively, said first and second ends of said braid covering said outer periphery of said bellows at said first and second cylindrical end parts thereof, respectively,

wherein said braid and each of said first and second protectors are overlaid on and closely adhered to said lateral side surfaces of said ridge parts at both said first and second cylindrical end parts of said bellows to form an overlaid portion, and said braid and at least one of said first and second protectors are integrally fixed at said lateral side surface of said overlaid portion by means of spot-welding.

5,813,705
SNAP-ACTION PIPE COUPLING RETAINER
Douglas R. Dole, Whitehouse Station, N.J., assignor to Victaulic Company of America, Easton, Pa.
Filed Jun. 18, 1996, Ser. No. 665,477
Int. Cl.[6] F16L *37/14;21/08*
U.S. Cl. 285—321 **28 Claims**



1. A pipe coupling, which comprises:

a) a tubular body having an inner opening and a generally transverse peripheral inner groove extending radially outwardly of said inner opening, said tubular body further having an aperture defined by at least one wall portion generally tangential to said inner groove, said aperture further being

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generally transverse to the central axis of said tubular body and communicating with said inner groove; and

b) a retainer member having at least two ends, said retainer member positionable within said inner groove through said generally tangential aperture and having a band of resilient material, and a plurality of resilient fingers extending therefrom at an acute angle to said band, each said resilient finger terminating at a free end on a first diameter less than an internal diameter of said tubular body, and being deflectable generally radially outwardly to a second diameter greater than said first diameter.

5,813,706

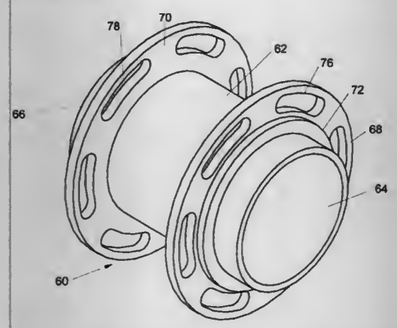
VARIABLE RADIAL ORIENTATION PIPE CONNECTOR

Billy W. Travis, Broken Arrow, Okla., assignor to Hydrant Repair Parts, Inc., Tulsa, Okla.

Filed May 21, 1997, Ser. No. 861,079

Int. Cl.[6] F16L *19/025*

U.S. Cl. 285—363 **7 Claims**



1. A variable radial orientation pipe connector for engagement with a pair of bell end fittings, which connector comprises:

a unitary tubular sleeve having opposed open ends;

a pair of flanges, integral with said sleeve, each said flange extending radially outward from said sleeve and spaced from each said open end, each said flange having a shoulder to abut a circular gasket, said flanges parallel to each other; and

a plurality of coaxially aligned arcuate slots in each said flange to receive fasteners therethrough whereby the radial orientation of the connector to the bell end fittings may be selected.

5,813,707

TROUGH-LIKE AIRBAG HOUSING

Stefan Bohn, Goldbach, Germany, assignor to MST Automotive GmbH, Aschaffenburg, Germany

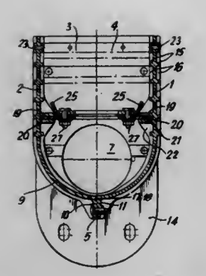
Filed Oct. 11, 1996, Ser. No. 728,926

Claims priority, application Germany, Oct. 19, 1995, 195 38 870.4

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—728.2 **17 Claims**

1. A trough-like housing made by casting in a mold, with a U-shaped cross section that is the same throughout its length, and with flat end side walls to accommodate a gas generator and an airbag for a passenger protection system in a motor vehicle, comprising two half shells of a substantially mirror-image configuration, with integrally molded side wall halves and means for



joining the two half shells comprising outwardly projecting flanges in contact with one another when assembled and formed on the half shells in a bottom junction area.

5,813,708

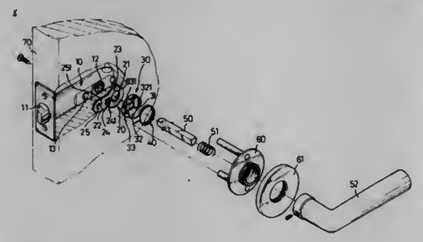
TUBULAR LATCH WITH A TORSION SPRING DISPOSED THERETO

Mu-Lin Shen, No. 32, Lane 76, Sec. 5, Taiwan, Taiwan

Filed Mar. 27, 1997, Ser. No. 824,489

Int. Cl.[6] E05C *1/12*

U.S. Cl. 292—165 **3 Claims**



1. A tubular latch comprising:

a latch body having one end with a throw reversibly received therein, a cam hole defined therethrough near a second end of said latch body and said latch body having a first hole defined in a middle portion thereof;

a first member having a ring portion having a second hole defined therein and a plate extending radially from said ring portion, said plate having a third hole defined therethrough and an annular lip extending therefrom and toward said latch body wherein said annular lip defines said third hole and is inserted into said first hole of said latch body, a first stop extending laterally from said first member and having a first recessed portion defined in an under edge thereof;

a second defined member having a fourth hole defined therein by an inner periphery and which has the same shape of that of an inner periphery defining said cam hole and shares the same axis with said cam hole and said second hole, at least two retaining lugs and a second stop respectively extending laterally from said second member;

a torsion spring retained between said retaining lugs and said second stop, one of the two legs of said torsion spring engagedly received within said first recessed portion and the other leg of said torsion spring disposed on said second stop, and

a spindle having one end thereof inserted into said cam hole of said latch body by said spindle being extended through said fourth hole of said second member and said second hole of said first member and, a second end of said spindle securely connected to an operating member.

5,813,709

VEHICLE DOOR LATCH DEVICE

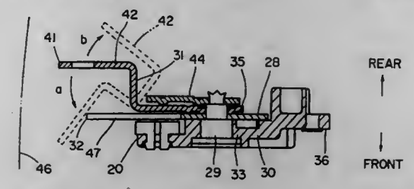
Masaaki Umino, Yamanashi-ken, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1996, Ser. No. 674,511

Claims priority, application Japan, Jul. 3, 1995, 7-189869

Int. Cl.[6] E05C *3/06*

U.S. Cl. 292—216 **12 Claims**



1. A vehicle door latch device for use with a vehicle door engaged on a vehicle body comprising:

a latch body for accommodating a latch to be engaged with a striker of the vehicle body and a ratchet to be engaged with the latch for holding the engagement between the latch and the striker;

a door opening mechanism provided on a rear side of the latch body for releasing the engagement between the latch and the striker;

a locking mechanism provided on the rear side of the latch body and displaceable between a locked condition for disabling an opening operation of the door opening mechanism and an unlocked condition for enabling the opening operation of the door opening mechanism;

a metal back plate (28) fixed to the rear side of the latch body;

said locking mechanism having a main lock lever (30) and a sub lock lever (31);

said main lock lever (30) having a base part (33) which is rotatably mounted to the back plate by a supporting shaft (29) and an inner part (36) which is adapted to extend from the base part (33) to an interior side of the vehicle door and is adapted to be connected to an inside lock button (37) of the vehicle door, said main lock lever being located on a front side of the back plate (28);

said sub lock lever (31) having a base part (35) which is rotatably mounted to the back plate (28) by the supporting shaft (29) and an outer part (42) which is adapted to extend from the base part to an exterior side of the vehicle door and is adapted to be connected to a key cylinder of the vehicle door;

said back plate having a protecting part located on a front side of the outer part of the sub lock lever so as to prevent the outer part of the sub lock lever from making contact with the main lock lever when the outer part of the sub lock lever is deformed.

5,813,710

FLUSH LOCK ACTUATOR

Todd A. Anderson, Conyngham, Pa., assignor to Truth Hardware Corporation, Owatonna, Minn.

Filed Apr. 8, 1997, Ser. No. 841,928

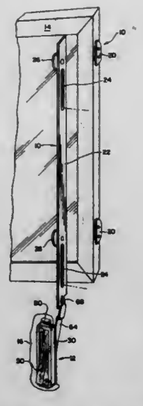
Int. Cl.[6] E05B *3/00*

U.S. Cl. 292—336.3 **17 Claims**

1. A lock for securing a window sash against a window frame, said lock comprising:

a housing mountable on a face of said window frame, said housing including a first face surface that surrounds an opening in said housing;

a handle pivotable on said housing within said opening between a first position where a window sash is locked to a window frame and a second position where a window sash is released from a window frame, said handle having a second face surface which substantially occludes said housing opening



when said handle is in said first position, said second face surface being substantially flush with said first face surface when the handle is in said first position;

a mechanism connector on each of said handle ends for selectively connecting one of said handle ends to a locking mechanism to secure said handle in its first position; and

a locking connector on each of said handle ends for selectively connecting one of said handle ends to a locking member which is mountable on a window frame and is engageable with a keeper mountable on a window sash to secure the window frame to the window sash in a closed position.

5,813,711

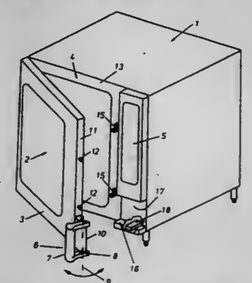
CLOSURE DEVICE FOR CONTROLLING A DOOR LOCK IN PARTICULAR FOR THE DOOR LOCK OF AN OVEN

René Sauvagnat, Hohberg, Germany, assignor to Premark FEG L.L.C., Wilmington, Del.

Continuation of Ser. No. 299,531, Sep. 1, 1994, abandoned. This application Dec. 13, 1995, Ser. No. 571,692

Int. Cl.[6] E05B *15/02*

U.S. Cl. 292—341.17 **10 Claims**



1. A closure device for controlling a door lock comprising:

an electrically controllable locking mechanism;

a door, a door frame, the door pivotally mounted on the frame and including a locking side and hinges lying opposite the locking side;

a U-shaped grip on the locking side of the door, said grip having a vertical grip arm and being rotatable about a vertical rotational axis of the grip;

holding members arranged on the locking side of the door;

locking hook members arranged on the door frame and being pivotable and displacable along longitudinal axes thereof in response to a signal from the electronically controllable lock-

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ing mechanism, and the position of the locking members corresponding to that of the holding members;

a holder extending from the locking side of the door in a fixed position for attachment of the U-shaped grip, the U-shaped grip being rotatably mounted on the holder, said grip being adapted to be rotated relative to the fixed holder and the door, in which the vertical rotational axis of the grip is arranged on the fixed holder and is distanced from both the locking side of the door and from the grip arm;

a magnet provided in a horizontal side of the grip arm for coacting with a magnetic switch secured in the frame and located at a distance from the locking side of the door and at the same level as the grip arm, the magnet and magnetic switch being arranged with respect to one another such that they adjacently oppose one another when the door is closed; and

wherein the magnetic switch supplies the signal for controlling the locking hook members on the door frame and is electrically connected with the electronically controllable locking mechanism.

5,813,712

MAGNETIC LOAD LIFTING DEVICE

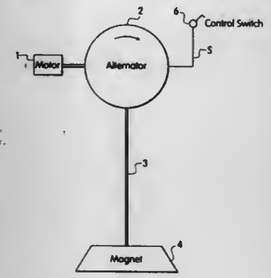
Winfried Mozelt, Duisburg, Germany, assignor to Mozelt GmbH & Co. KG, Duisburg, Germany

Filed Sep. 5, 1996, Ser. No. 708,540

Claims priority, application Germany, Sep. 12, 1995, 195 33 740.9

Int. Cl.[6] B66C *1/04*

U.S. Cl. 294—65.5 **13 Claims**



1. A magnetic lifting device comprising

(a) a load lifting magnet having at least one magnetic coil arranged in a housing,

(b) a driven synchronous alternator arranged in a housing for generating a current supplied to the magnetic coil,

(1) the alternator comprising a first and second three-phase winding,

(c) a supply line coupling the alternator to the magnetic coil for supplying direct current to the magnetic coil,

(d) an electrical switching circuit with a control line arranged within the alternator housing,

(e) a control switch disposed outside the alternator housing, and

(f) a further control line disposed outside the alternator housing, said further control line connecting said control switch to said control line of the electrical switching circuit.

5,813,713

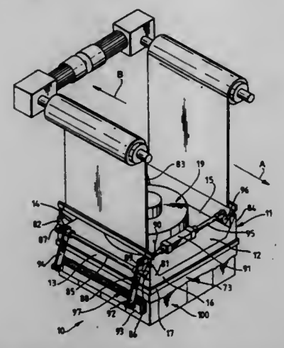
GRID ELEMENT AND AN APPARATUS INCORPORATING THE GRID ELEMENT FOR ASSISTING IN THE STACKING AND DESTACKING OF PRODUCTS FROM A SURFACE

John Van Den Bergh, County Kildare, Ireland, assignor to Autocast Inventions Limited, County Kildare, Ireland

Filed Nov. 8, 1996, Ser. No. 746,303

Int. Cl.[6] B66C *1/02;* **B25J** *15/06*

U.S. Cl. 294—65 **6 Claims**



6. An apparatus for lifting one or more objects by means of suction, which apparatus comprises a vacuum chamber, a grid element forming the floor of the vacuum chamber, and means for creating a vacuum in the vacuum chamber, the grid element comprising a two-dimensional array of cells each of which opens directly onto each opposite major surface of the grid element, each cell having at least one valve member for closing and opening of the cell, the valve member(s) normally assuming a first position wherein the cell is open to provide direct communication through the cell between the opposite major surfaces of the grid element but being movable by a sufficient flow of air through the cell into a second position wherein the cell is substantially closed against such communication, wherein each valve member comprises a flap valve pivoted for rotation between the first position and the second position, and means for supporting the grid element within the vacuum chamber,

the apparatus further comprising a pair of opposing gripper elements operatively associated with the vacuum chamber and movable between a first position in which the gripper elements are not in positive gripping contact with a load attached to the vacuum chamber and a second position in which the gripper elements grip a load attached to the vacuum chamber, and wherein means are provided for automatically moving the gripper elements to the second position when the vacuum at the vacuum chamber falls to a predetermined level.

5,813,714

TAILGATE AND RAMP ASSEMBLY

Paul Lawrence Lipinski, Plymouth; Terrance Dean Savitsky, Dearborn, and Stacey Ann Boersma, Livonia, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jan. 16, 1997, Ser. No. 784,330

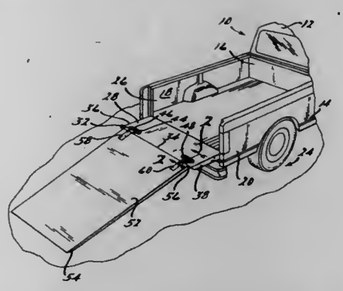
Int. Cl.[6] B60P *1/43*

U.S. Cl. 276—61 **1 Claim**

1. A tailgate and ramp assembly for a truck having a pair of laterally spaced side walls extending rearwardly from a cab, terminating in rear ends and joined by a laterally extending bed floor, the tailgate being pivotally mounted with respect to the side walls for movement between a vertical closed position and a horizontal open position, and comprising:

an outer surface facing external of the truck;

an inner surface facing internal of the truck;



anchor means comprising at least one rod member mounted between the tailgate inner surface and the tailgate outer surface and accessible from the tailgate inner surface;

a ramp pivotally mountable on the anchor means; and

at least one mounting member carried on one edge of the ramp and projecting outwardly from the one edge and adapted to pivotably engage the anchor means, said at least one mounting member further comprising a hook portion pivotably engageable with the at least one rod member and a support portion supportively engagable against the tailgate inner surface.

5,813,715

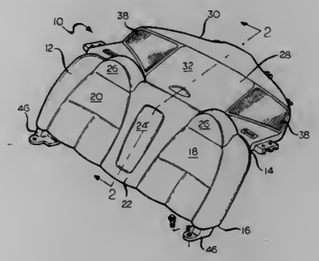
REAR SEAT AND PACKAGE TRAY SUB ASSEMBLY

Vijay Musukula; Andrew Massara, both of Southfield; James Masters, Farmington Hills; Philip Leistra, III, Novi; Majid Arefi, Troy, and Dan Bateson, Ferndale, all of Mich., assignors to Lear Corporation, Southfield, Mich.

Filed Aug. 29, 1996, Ser. No. 705,512

Int. Cl.[6] B60N *2/00*

U.S. Cl. 296—63 **30 Claims**



1. An automotive rear seat assembly comprising:

a seat back having a top and a bottom for supporting the back of an occupant, said seat back including a back frame and cushioning material supported by said back frame,

a package tray extending from said top of said seat back to an outer periphery,

a rotational connection between said tray and said top of said seat back, said rotational connection interconnecting said back frame and said tray, and

attachment members along said outer periphery of said tray for attachment to a vehicle,

whereby said rear seat assembly may be shipped with said tray substantially overlying said seat back and installed in a vehicle by rotating said tray relative to said set back to a position transverse to said seat back.

5,813,716

Patent Not Issued For This Number

5,813,717

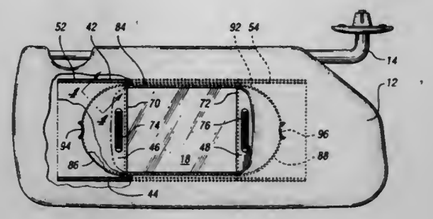
CABLE OPERATED DUAL SYNCHRONOUS OPENING MIRROR DOORS FOR SUN VISORS

Douglas J. Wilson, Ft. Gratiot, Mich., assignor to Automotive Industries, Inc., Rochester Hills, Mich.

Continuation of Ser. No. 648,654, May 15, 1996. This application Aug. 19, 1997, Ser. No. 914,460

Int. Cl.[6] B60J *3/00*

U.S. Cl. 296—97.5 **10 Claims**



1. A visor mirror assembly for a vehicle comprising:

a hollow shell having a mirror supported by a housing within the shell;

said housing having a track adjacent the mirror and a pair of split pulley portions sufficiently outboard of said mirror and aligned to define a pathway around said mirror;

a pair of opposed doors slidably mounted to said housing for movement in said track toward one another between a substantially abutting closed position for covering said mirror and away from one another toward an open position exposing said mirror for use, one of said doors having a first side adjacent said pathway on one side of said mirror and the other of said doors having second side adjacent said pathway on the opposite side of said mirror; and

continuous flexible means extending around said pathway and said mirror in concealably spaced relationship with said track, said flexible means being fixed at one point with respect to said first side of said one of said doors and being fixed at another point with respect to said second side of said other of said doors for intercoupling said doors such that movement of said one door synchronously moves said other door in an opposite direction and through the same distance.

5,813,718

GUARD BEAM FOR AUTOMOTIVE DOOR STRUCTURE

Mituo Masuda, and Takuo Sano, both of Shizuoka, Japan, assignors to Yamakawa Industrial Co., Ltd., Fuji, Japan

Filed Sep. 25, 1995, Ser. No. 533,836

Claims priority, application Japan, Feb. 14, 1995, 7-025087

Int. Cl.[6] B60J *5/04*

U.S. Cl. 296—146.6 **12 Claims**

1. A guard beam of an automotive door structure comprising:

a beam portion integrally made of a high tension steel blank member, having a substantially triangular cross section with a bottom plate portion, support plate portions extending from a peak of the triangular configuration remote from said bottom plate portion in a direction substantially perpendicular to said bottom plate portion, and side plate portions each connecting each end of said support plate portions at said peak to the transverse edge of said bottom plate portions, respectively; and

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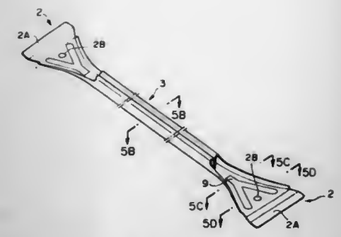
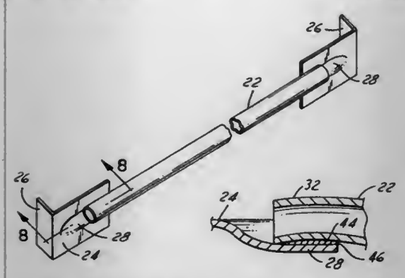


a palm portion integrally formed with said beam portion at both longitudinal ends of said beam portion for securing said guard beam on a structural member of an automotive door.

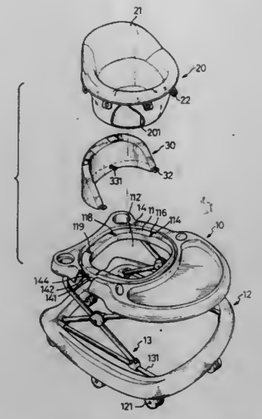
5,813,719
SIDE INTRUSION BEAM ASSEMBLY HAVING COMPENSATING WELDS AT BRACKETS
Daniel J. Kowalski, Lake Orion, Mich., assignor to Trim Trends, Inc., Farmington Hills, Mich.
Filed Sep. 25, 1997, Ser. No. 937,514
Int. Cl.[6] B60J *5/04*
U.S. Cl. 296—146.6 **20 Claims**



1. A side intrusion beam assembly comprising:
a pair of end brackets, at least one of said brackets having a weld portion;
a beam body coupled to said brackets, said weld portion and said beam body forming a gap therebetween,
weld material filling said gap and coupling the beam body to the weld portion.

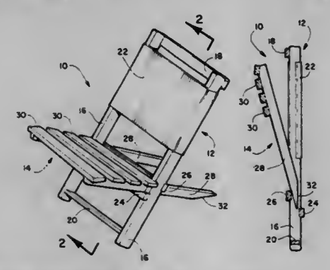
5,813,720
BABY WALKER
Li-Chu Chen Huang, Chiayi, Taiwan, assignor to Discovery International Co., Ltd., Tortola, United Kingdom
Filed Dec. 5, 1997, Ser. No. 986,033
Int. Cl.[6] B62B *9/12*
U.S. Cl. 297—5 **3 Claims**

1. A baby walker comprising:
an upper part having an opening defined therethrough and a groove defined in an upper surface thereof so as to form a collar member which defines said opening, said collar member having an arc portion which has a raised upper surface so as to define two apertures between an upper surface of the collar member and said raised upper surface of said arc portion, said two apertures located diametrically opposite to each other on said collar member, said raised upper surface having two first hooks respectively formed to an underside of two distal ends thereof which respectively define said two apertures;



a lower part being a ring member and having a plurality of wheels rotatably disposed to an underside thereof;
two pairs of crosswise connected links adjustably connected between said upper and lower members;
a back member having two second hooks extending from two lower ends thereof so as to be inserted through said two apertures and engaged with said two first hooks, and
a seat member having two holes defined in a lower portion thereof and an envelope portion extending upwardly therefrom which has a lower periphery, said back member being received in said envelope portion and said envelope portion being securely connected to said collar member.

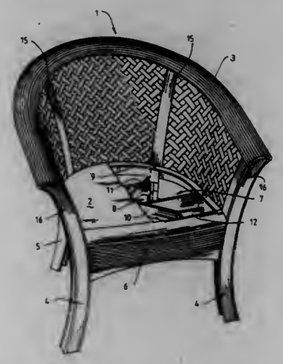
5,813,721
PORTABLE COLLAPSIBLE CHAIR
Augustine D. Arcidiacono, 8838 La Jolla Scenic Dr., La Jolla, Calif. 92037
Filed Jun. 30, 1997, Ser. No. 885,890
Int. Cl.[6] A47C *4/00*
U.S. Cl. 297—16.1 **16 Claims**



1. A two-piece portable chair which comprises:
a seat member having top and bottom surfaces;
two spaced generally parallel seat side members each having a proximal and a distal end;
a plurality of slats extending across said seat side members adjacent to said proximal end on said top surface;
said slats extending beyond said seat side members a predetermined distance;
said seat side members being tapered at said distal end along said bottom surface; and
a back member having front and back surfaces, comprising:
two spaced generally parallel back side members each having a proximal and a distal end;

said back side members being spaced apart a predetermined distance such that said seat side members can slide therebetween;
a first transverse cross piece secured to said back side member distal ends;
a second transverse cross piece secured to said back side member proximal ends;
a sheet of flexible material extending between said back side members adjacent to said distal end across said front surface;
a first support member extending between said back side members and secured to said back surface between said proximal end and said sheet;
a second support member extending between said back side members and secured to said front surface between said proximal end and said first support member;
said first and second support member being spaced apart a predetermined distance for receiving said distal end of said seat member therebetween with said seat member at a predetermined angle to said back member; and
said seat member and back member having predetermined dimensions such that said distal end of said seat member can be inserted between said first and second support members along a line generally parallel to said back member and toward said back member distal end to wedge said tapered distal end between said first and second support members when said chair is in a storage position.

5,813,722
STACKABLE CHAIR
Stephen Trevor Smith, Richmond, Australia, assignor to Hartman Leisure Australia Pty. Ltd., Australia
PCT No. PCT/AU95/00148, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1996, PCT Pub. No. WO95/25453, PCT Pub. Date Sep. 28, 1995
PCT Filed Mar. 17, 1995, Ser. No. 714,147
Claims priority, application Australia, Mar. 18, 1994, PM4586
Int. Cl.[6] A47C *3/04*
U.S. Cl. 297—239 **4 Claims**

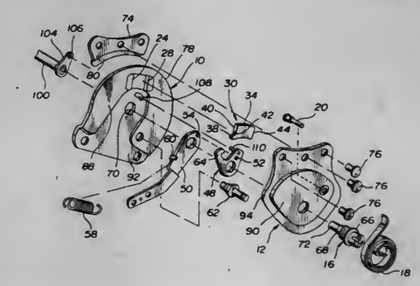


1. A plurality of stackable chairs having a first chair adapted for vertical nest-wise stacking engagement with at least another second substantially identical chair of said plurality of stackable chairs, each of said first and second chairs comprising:
a body portion having an open seat cavity; said body portion also having at least one rear leg; said open seat cavity being bounded by a support perimeter comprising a front, a back, and first and second sides;
said body portion further comprising at least one support member having opposite ends secured to and traversing said support perimeter from at least one of said sides to at least one of said front and back, said support member having a central section between said ends, said central section being spaced from said sides and said front and said back to define at least one open leg cavity within said open seat cavity;
said body portion being formed integrally via injection molding; and
a seat portion normally on said support perimeter, said seat portion being removable from said support perimeter for exposing said open seat cavity and said at least one support member when said removable seat portion is removed from said support perimeter;
with either said first or second chairs being an upper chair and the other of said first or second chairs being a lower chair below said upper chair, said rear leg of said upper chair being adapted to extend within said support perimeter and without interference from said support member pass through said open leg cavity of said lower article of furniture when said seat portion of said lower chair has been removed from said support perimeter of said lower chair so that said chairs of furniture may be vertically stacked on top of each other.

5,813,723

Patent Not Issued For This Number

5,813,724
ADJUSTABLE HINGE MOUNT FOR RECLINABLE SEAT
Hiroshi Matsuura, Hamamatsu; Kunihisa Sugimoto, Kosai; Isao Ikegaya, Arai, and Masakiyo Obya, Kosai, all of Japan, assignors to Fuji Kiko Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1996, Ser. No. 668,810
Claims priority, application Japan, Jun. 23, 1995, 7-157437; Jun. 30, 1995, 7-165819; Jun. 30, 1995, 7-165820; Jun. 30, 1995, 7-165821; Jul. 6, 1995, 7-170079; Nov. 30, 1995, 7-312206; Dec. 26, 1995, 7-338345; Jan. 30, 1996, 8-013464; Mar. 28, 1996, 8-073024
Int. Cl.[6] B60N *2/02;2/48*
U.S. Cl. 297—367 **41 Claims**



1. An adjustable hinge mount for a seat having a seat proper and a seat back adjustable relative to the seat proper, comprising:
a first hinge member adapted to be fixed to the seat proper;
a second hinge member adapted to be fixed to the seat back;
an axle interconnecting said first and second hinge members;
a spring coupled between said first and second hinge members for pivotally biasing said second hinge member in one direction about said axle relative to said first hinge member;
internal teeth formed in said second hinge member along an arcuate surface thereof, centered on said axle;
a bearing plate having upper teeth, which lockingly cooperate with said internal teeth, said bearing plate having first and second lower surface parts and front and rear faces;
wherein said first hinge member has spaced guide walls for guiding said bearing plate in reciprocal directions relative to

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said guide walls, said guide walls slidably cooperating with said front and rear faces of said bearing plate; and

control members for controlling the motion of said bearing plate into and out of engagement with said internal teeth, said control members including a lever pivotally connected to said first hinge member and a cam in unitary motion with said lever for camming said upper teeth of said bearing plate into engagement with said internal teeth of said second hinge member,

wherein said cam has a first elevated portion cooperating with said first lower surface part for pushing said bearing plate into locking engagement with said internal teeth, and a second elevated portion cooperating with said second lower surface part for engaging said second lower surface part to prevent said bearing plate from moving out of locking engagement with said internal teeth when, with said bearing plate in locking engagement with said internal teeth, said second hinge member is pivotally biased.

5,813,725

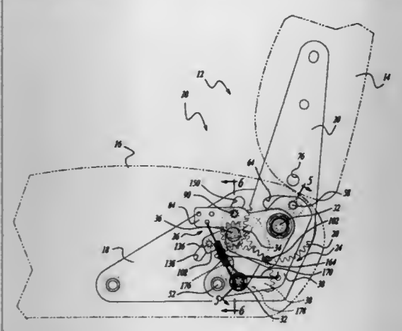
ROTARY GEAR LOCK SEAT RECLINER

David L. Robinson, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Sep. 4, 1997, Ser. No. 923,887

Int. Cl.[6] B60N *2/02*

U.S. Cl. 297—367 **27 Claims**



1. A seat recliner for adjusting the angular position of a seatback relative to a seat bottom, comprising:

a first member adapted to be secured to the seat bottom;

a second member adapted to be secured to the seatback and supported for pivotal movement relative to said first member;

a latching mechanism operable in a latched mode for inhibiting pivotal movement of said second member relative to said first member and in an unlatched mode for permitting such pivotal movement of said second member, said latching mechanism having a first gear non-rotatably fixed to said second member, a second gear rotatably supported on said first member and meshed with said first gear, and a third gear meshed with said first gear; and

a recline actuator mechanism for shifting said latching mechanism from said latched mode into said unlatched mode in response to movement of said third gear from a first position to a second position, said third gear being meshed with said second gear in said first position and unmeshed with said second gear in said second position.

5,813,726

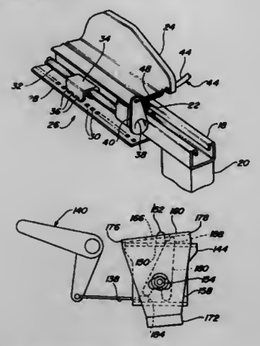
INERTIA LOCKING DEVICE FOR A VEHICLE SEAT ADJUSTMENT MECHANISM

David W. Husted, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Feb. 18, 1997, Ser. No. 801,199

Int. Cl.[6] B60N *2/02*

U.S. Cl. 297—378.11 **16 Claims**



1. A vehicle seat assembly comprising:

a first section;

a second section coupled to and movable relative to the first section;

latch means for holding the second section in place relative to the first section, the latch means including a latch member carried by one of the first and second sections, the latch member being movable between a latched position and a released position, the latch member engaging the other of the first and second sections in a latching relationship when in the latched position to hold the second part in place relative to the first part and the latch member being disengaged from the other of the first and second sections to enable movement of the second part relative to the first part when in the released position, the latch means including bias means for urging the latch member into the latched position;

release means for selectively moving the latch member to the released position to enable movement of the second part relative to the first part when the release means is actuated; and

inertia responsive means for overriding the release means in response to a vehicle collision occurring when the release means is actuated and the latch member is in the released position, the inertia responsive means overriding the release means to enable the latch member to return to the latched position even though the release means is actuated.

5,813,727

MASSAGING CHAIR

Akihide Sugawa; Hikoyoshi Hara; Masatoshi Dairin; Hironobu Sakaue, and Fumihiro Nishio, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Continuation of Ser. No. 426,079, Apr. 21, 1995, abandoned. This application Aug. 30, 1996, Ser. No. 706,359

Claims priority, application Japan, Jun. 27, 1994, 6-145174

Int. Cl.[6] A47C *7/54*

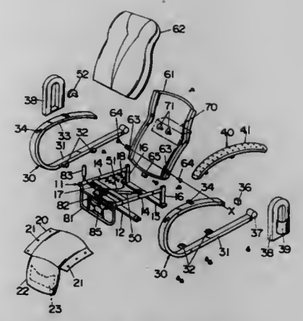
U.S. Cl. 297—411.42 **5 Claims**

1. A massaging chair comprising:

a frame structure;

a seat attached to said frame structure;

a reclining backrest connected to said frame structure by a seat frame for pivotal movement about a pivot axis between an upright position and a horizontal position with respect to said seat;



a massager disposed on said reclining backrest to give a massage to a back of a user resting on said seat;

said frame structure including said seat frame supporting a seat cushion and a pair of generally U-shaped legs disposed on opposite sides of said seat frame, each said leg having a straight elongated base adapted to engage a floor and a continuously curved portion extending upwardly from said elongated base in offset, substantial overlying relation thereto as a continuously curved cantilevered continuation thereof, said continuously curved portion of said leg extending rearwardly beyond a surface of said backrest adjacent said seat when said backrest is in said horizontal position and defining an armrest having an arm-receiving surface which is convexly curved outward with respect to said backrest pivot axis and extending with respect to said pivot axis at a substantially constant radius in a region of said continuously curved portion of said frame structure to be engaged by an arm of a user, whereby said arm of said user resting on said armrest maintains a substantially constant angle of deflection with respect to said backrest when said backrest is in positions between said upright position and said horizontal position;

each said straight elongated base having stubs extending inwardly therefrom; and

at least one of a front foot plate and a rear foot plate supporting said seat frame, each of said foot plates having side ends receiving respective ones of said stubs, thereby connecting said legs to said seat frame.

5,813,728

PROCESS FOR MAKING ROTATING BRUSHES FOR AUTOMATIC CAR WASHES

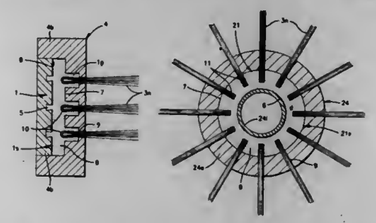
Max Zigerlig, Tenero, Switzerland, assignor to Nowiteck Establishment, Vaduz

Filed Sep. 3, 1996, Ser. No. 697,889

Claims priority, application Switzerland, Mar. 7, 1996, 00596/96

Int. Cl.[6] A46D *1/08*

U.S. Cl. 300—21 **11 Claims**



1. Process for making a rotating brush for use in automatic car washing facilities, and comprising a support which has an inner face and an outer face, and flexible cleaning elements attached to the outer face, the process comprising:

a) preparing a mold defining the shape of the desired rotating brush;

b) arranging the flexible cleaning elements with one end inserted into the mold and the other end projecting outwardly through suitable openings made in the mold;

c) injecting into the mold components of a polymer synthetic resin in the fluid state, said components being proportioned to cause polymerization of the resin whose volume increases and fills the mold, said polymerization taking place without any added heat or pressure; and

d) opening the mold once polymerization is complete, and extracting the brush in which the flexible cleaning elements are attached to a support and embedded in the polymerized resin.

5,813,729

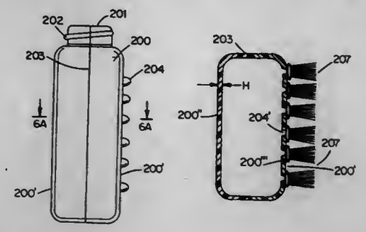
BLOW-MOLDED BRUSHWARE AND METHOD OF FUSING THE SAME

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Forestdale, Vt.

Filed Mar. 11, 1997, Ser. No. 816,034

Int. Cl.[6] A46D *1/08;3/00*

U.S. Cl. 300—21 **10 Claims**



1. A method for fabricating a tufted construction by fusing synthetic filament tufts onto the outer surface of a thin walled synthetic hollow container comprising:

providing a thin walled hollow container having a tuft receiving outer surface and a plurality of mutually spaced protrusions extending perpendicularly outwardly in a predetermined pattern;

providing a plurality of parallel cut-to-length synthetic filament tufts, each tuft having a thickness and a non-working end;

providing a source of heat and fusing the non-working ends of said tufts and the protrusions on said container therewith;

indexing the fused end of each tuft into a fused protrusion and allowing said fused tuft ends and protrusions to cool whereby said tufts are integrally attached to said container to form said tufted construction.

5,813,730

RETROFIT AIR DISTRIBUTION APPARATUS FOR A LOCOMOTIVE BRAKING SYSTEM

Herman Marshall Force, Parkville, Mo., assignor to Technical Services and Marketing, Inc., Kansas City, Mo.

Filed Nov. 26, 1996, Ser. No. 753,544

Int. Cl.[6] B60T *7/00*

U.S. Cl. 303—15 **14 Claims**

1. In a locomotive braking system including a brake cylinder, a brake valve, a reservoir of pressurized air, and a control valve, the brake valve including an operating air inlet for receiving operating air from the reservoir, and a control air inlet for receiving control air from the control valve, an air distribution apparatus for allowing at least partial control of the braking system by an electronic control device, said air distribution apparatus comprising:

a distribution body configured for connection with the brake valve;

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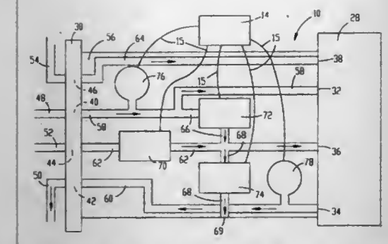


an operating air passageway extending through said distribution body for delivering operating air from the reservoir to the operating air inlet of the brake valve;

a control air passageway extending through said distribution body for delivering control air from the control valve to the control air inlet of the brake valve;

interrupting means disposed within said control air passageway for interrupting the delivery of control air from the control valve to the control air inlet of the brake valve; and

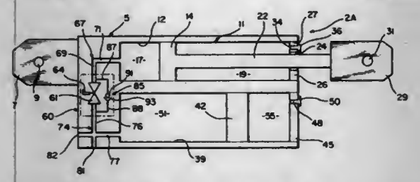
diverting means coupled between said operating air passageway and said control air passageway for diverting a portion of the operating air in said operating air passageway to said control air passageway for controlling the operation of the brake valve with the diverted operating air.

5,813,731

HYDRAULIC PARKING BRAKE SYSTEM FOR RAILWAY VEHICLES

George A. Newman, II, Catawba, and Scott W. Jones, Richmond, both of Va., assignors to HHB Limited, L.L.C., Roanoke, Va.

Filed Jun. 17, 1996, Ser. No. 664,346
Int. Cl.[6] B60R *25/08*
U.S. Cl. 303—89 **50 Claims**



1. A railway car parking brake system comprising:

an actuator including a piston, cylinder, and an actuator rod, said piston being movably mounted within said cylinder so as to divide said cylinder into at least first and second chambers, said actuator rod having a first end portion secured to said piston for movement between extended and retracted positions and a second end portion that extends from said cylinder, one of said cylinder and the second end portion of said actuator rod being adapted to be attached to a support portion of a railway car and the other of said cylinder and the second end portion of said actuator rod being adapted to be attached to a movable railway car service brake actuating member such that movement of said piston relative to said cylinder will shift the movable railway car service brake actuating member relative to the support portion of the railway car;

a reservoir adapted to house a supply of liquid;

a conduit system fluidly interconnecting said reservoir to the first chamber of said cylinder; and

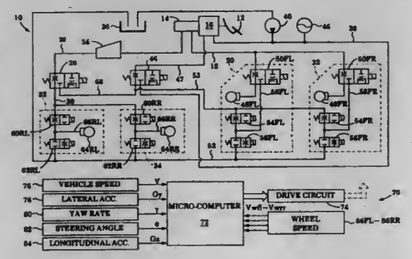
at least one valve member interposed within said conduit system between said reservoir and the first chamber of said cylinder for controlling liquid flow through said conduit system, said valve member including a one-way valve arranged to continuously block liquid flow out of the first chamber towards the reservoir while permitting flow of liquid into the first chamber from the reservoir.

5,813,732

STABILITY CONTROL DEVICE OF VEHICLE OPERATIVE AGAINST SPIN AND DRIFT-OUT IN HARMONY

Shirou Monzaki, Mishima, and Shoji Inagaki, Numazu, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1996, Ser. No. 723,757
Claims priority, application Japan, Oct. 6, 1995, 7-286416
Int. Cl.[6] B60T *8/58*
U.S. Cl. 303—146 **4 Claims**



1. A stability control device of a vehicle having a vehicle body, and front left, front right, rear left and rear right wheels, comprising:

means for estimating a liability of the vehicle body to spin for producing a spin quantity which generally increases along with an increase of the spin liability;

means for estimating a liability of the vehicle body to drift-out for producing a drift-out quantity which generally increases along with an increase of the drift-out liability;

brake means for selectively applying a variable braking force to each of said wheels; and

control means for controlling said brake means so as to apply a variable braking force to a selected one or ones of said wheels for suppressing the vehicle body against spin and/or drift-out when the vehicle is driven along a curved course,

wherein said control means controls said brake means such that a first braking force is applied to one of said front wheels located at the outside of a turn of the vehicle along the curved course according to an increase of said spin quantity, and a second braking force is applied to at least one of said rear wheels according to an increase of said drift-out quantity, said first braking force being decreased according to a simultaneous application of said second braking force to said at least one rear wheel.

5,813,733

METAL CORE MEMBER FOR RUBBER CRAWLER BELT, THE RUBBER CRAWLER BELT AND METHOD OF WINDING THE SAME

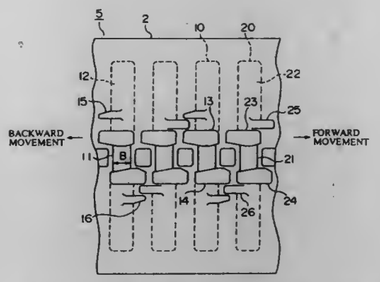
Kazutoshi Hori, and Ryuichi Saiga, both of Osaka, Japan, assignors to Komatsu Ltd., Tokyo, Japan

PCT No. PCT/JP95/00803, § 371 Date Oct. 28, 1996, § 102(e) Date Oct. 28, 1996, PCT Pub. No. WO95/29088, PCT Pub. Date Nov. 2, 1995
PCT Filed Apr. 24, 1995, Ser. No. 737,254
Claims priority, application Japan, Apr. 26, 1994, 6-112027
Int. Cl.[6] B62D *55/24*
U.S. Cl. 305—172 **36 Claims**

1. A metal core member suitable for use in a rubber crawler belt, said metal core member comprising:

a first edge and a second edge spaced apart from each other and extending along a length of said metal core member;

a left rail and a right rail separated from each other along said length of said metal core member by a wheel engaging portion of said metal core member so that said left rail has an



left inner surface facing said right rail across said wheel engaging portion and said right rail has an right inner surface facing said left rail across said engaging portion;

each of said right and left rails having a height so as to form surfaces on which a flanged idler wheel can rotate while a flange of said flanged idler wheel can move between said left and right inner surfaces;

wherein at least one of said left and right rails projects beyond said first edge and at least one of said left and right rails projects beyond said second edge, with a first one of said left and right rails projecting further beyond said first edge than a second one of said left and right rails and with one of said left and right rails projecting further beyond said second edge than the other of said left and right rails;

wherein a first end portion of said left inner surface forms a first left guide slope and a first end portion of said right inner surface forms a first right guide slope for facilitating entry of said flange of said flanged idler wheel between said left and right inner surfaces when said metal core member is moving in a first direction;

wherein a second end portion of said left inner surface forms a second left guide slope and a second end portion of said right inner surface rail forms a second right guide slope for facilitating entry of said flange of said flanged idler wheel between said left and right inner surfaces when said metal core member is moving in a second direction, said second direction being opposite to said first direction;

wherein said first left guide slope has a length which is greater than a length of said second left guide slope; and

wherein said first right guide slope has a length which is greater than a length of said second right guide slope.

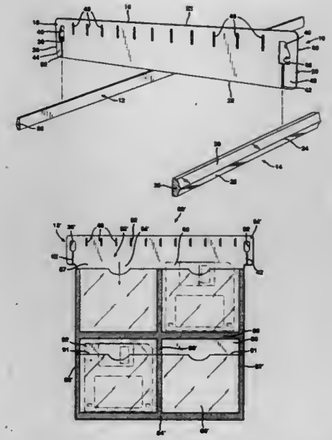
5,813,734

FILING GUIDE

Bon S. Ong, P.O. Box 4247, Torrance, Calif. 90510

Filed Sep. 17, 1996, Ser. No. 715,002
Int. Cl.[6] B42F *13/02*
U.S. Cl. 312—184 **4 Claims**

1. A file guide for use in a hanging file that has a pair of rigid, laterally-spaced, parallel rails held elevated at the top of a file storage compartment wherein said rails are of a uniform cross section throughout their lengths and said rails narrow in cross-sectional thickness both above and below their centers, comprising: a thin, flat member longer than the distance between said parallel rails and having a bounding perimeter and defining at its opposite ends within said perimeter a pair of rail openings formed entirely within the structure of said flat member, and said rail openings have upper and lower portions and the shape of said upper portions of said rail openings conforms to the shape of the cross-sectional thickness of said rails above said centers of said rails, wherein each of said rail openings is large enough to receive and surround one of said rails, said flat member further defining access slits narrower than said rails in said opposite ends of said flat member that extend between said rail openings and said perimeter, and said flat member is sufficiently elastically deformable to spread apart at said slits thereby being adapted to permit



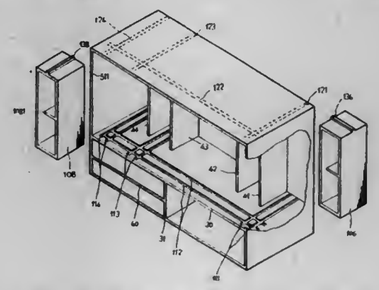
passage of said rails through said slits and sufficiently resilient to return to an undeformed condition thereby being adapted to capture said rails within said rail openings after passage of said rails through said access slits.

5,813,735

COMBINATION-TYPE HIDING SIDEBOARD WITH MOVABLE CABINETS

Chin-Jung Wu, No. 28-5, Chang-Der Street, Shu-Lin Town, Taipei Hsein, Taiwan

Filed Aug. 29, 1996, Ser. No. 705,047
Int. Cl.[6] A47B *97/00;53/02*
U.S. Cl. 312—204 **9 Claims**



1. A sideboard with movable hidden and visible cabinets comprising;

a) a body having a top panel with a lower surface, a middle panel having an upper surface, two opposite side panels and a seat panel connecting the top and middle panels so as to bound an interior spaced having an open front portion;

b) at least one first grooves formed in the upper surface of the middle panel and extending substantially adjacent and parallel to the open front portion;

c) at least one second grooves formed in the upper surface of the middle panel and extending substantially perpendicular to the at least one first grooves;

d) a plurality of first cabinets located in the body so as to be movable along the at least one first grooves; and,

e) at least one second cabinet located in the body so as to be movable along the at least one second grooves between a first position adjacent to the open front portion of the body and a

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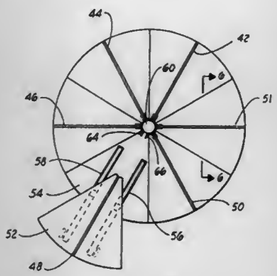
second position adjacent to the seat panel, whereby the first cabinets can be moved in front of the at least one second cabinet when in its second position to prevent viewing the at least on second cabinet from the open front portion.

5,813,736
CABINET STORAGE DEVICE
Ann Ballew, 3309 E. Elm, El Reno, Okla. 73036
Filed Sep. 12, 1996, Ser. No. 707,901
Int. Cl.[6] A47B *88/20*
U.S. Cl. 312—249.9 **5 Claims**



1. A cabinet storage device comprising:

a base slidingly attached to a cabinet so that the base is movable outwardly from a storage position to an extended position, the storage position placing the sliding base generally inside the cabinet and the extended position displacing the sliding base horizontally outward from the cabinet;

a front having an upper end and lower end, wherein the lower end is secured to the base and extends upwardly therefrom to the upper end;

a back having an upper end and a lower end, wherein the lower end is secured to the base and extends upwardly therefrom to the upper end;

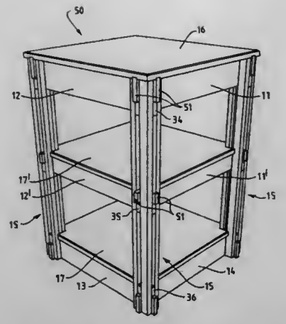
one or more generally vertical panels connected to the front and the back, so said generally vertical panels move along with said base from the storage position to the extended position and wherein each panel includes means for attaching items to the panel so easy access to said attaching means is provided when said base is in an extended position; and further comprising at least one support means to provide additional support for the base when the base is extended outwardly from the cabinet, wherein the support means comprises: a retractable arm having two ends, one end being pivotally connected to the cabinet storage device so the arm extends downwardly from the base to the second end when the arm is in the extended position, wherein the arm pivots upwardly to a storage position when the base is in the storage position.

5,813,737
CONSTRUCTION SYSTEM
Adrian Thomas Stone, 783 High Street, Regent, Victoria 3073, Australia
Filed Feb. 13, 1997, Ser. No. 799,123
Int. Cl.[6] A47B *47/00*
U.S. Cl. 312—257.1 **25 Claims**

1. A construction system suitable for erecting a modular structure, said system including:

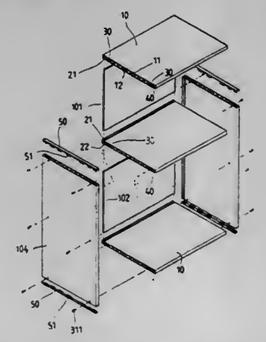
a first part,

a second part connectable with the first part by means of a releasable cross connection; and



an elongate third part having a cavity extending substantially over its full length, said cavity being adapted to receive said cross connection at any one of several positions along the length of said cavity.

5,813,738
FURNITURE COMBINATION
Wen Sen Cheng, No. 148-1, Chung San Road, Sa Lu Town, Taichung Hsien, Taiwan
Filed Jun. 20, 1997, Ser. No. 879,310
Int. Cl.[6] A47B *87/00*
U.S. Cl. 312—263 **4 Claims**



1. A furniture combination comprising:

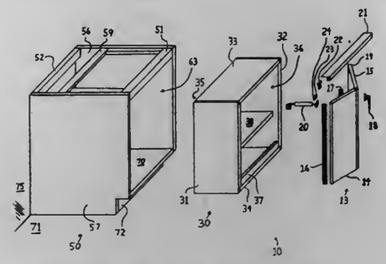
at least two plates, at least two panels, and at least one board, said at least two plates and said at least two panels each including a plurality of ribs for defining and for forming a plurality of openings, said at least two plates each including four corners each having a block, said blocks each including at least one helical fin for engaging with fasteners, said at least two plates each including a front side portion having an orifice and each including a rear side portion having at least one groove for engaging with said board,

said at least one helical fin being provided for engaging with the fasteners and for allowing said furniture combination to be assembled without being damaged,

said at least two panels each including a top portion and a bottom portion,

a plurality of strips for engaging with said top portions and said bottom portions of said at least two panels, said strips each including a plurality of ears for engaging with said openings and for allowing said strips to be secured to said at least two panels, said ears each including a puncture for engaging with a fastener.

5,813,739
FLAMMABLE MATERIAL STORAGE CABINET
Joseph J. White, Collegedale, Tenn., assignor to Collegedale Casework, LLC, Collegedale, Tenn.
Filed Oct. 29, 1997, Ser. No. 960,006
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—409 **20 Claims**



1. A flammable material storage cabinet comprising:

(a) a cabinet frame having a front, a rear and a base;

(b) a storage container insert removably installed within the cabinet frame, the storage container insert having a closed rear portion and an open front portion and being constructed of wood;

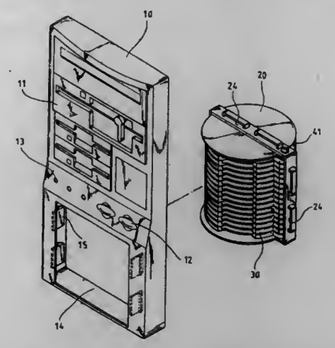
(c) wherein the storage container insert is sized relative to the cabinet frame such that when the storage container insert is installed with the open front portion proximate to the front of the cabinet frame, a space remains within the cabinet frame behind the rear portion of the storage container insert;

(d) the storage container insert further comprising a pan capable of containing at least a two inch depth of liquid;

(e) a door biased to a closed position to seal the open front portion of the storage container insert; and

(f) a door catch device for retaining the door in an open position and releasing the door in the presence of a preselected ambient temperature.

5,813,740
COMPACT DISK STORAGE TOWER ASSOCIATED WITH A COMPUTER CASE
I-Chen Chang, Pan-Chyau Shih, Taipei Hsien, Taiwan
Filed Mar. 25, 1997, Ser. No. 823,135
Int. Cl.[6] A47B *81/06*
U.S. Cl. 312—223.2 **5 Claims**



1. A compact disk storage tower associated with a front panel of a computer case comprising:

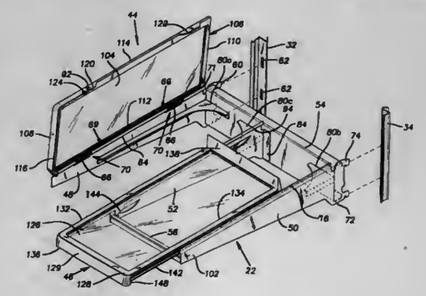
a front panel of a computer case including an opening and opening peripheral rims with barbed fingers on the back side of a panel;

a housing having a wide open front, a plurality of curved ledges formed on a internal side walls, a pin hole located away from said ledges and extending from the top of said housing to the bottom, low raised posts disposed on the bottom of said housing to reduce friction engaging openings, and an upper and a lower groove integrally molded on exterior walls of said housing;

a plurality of compact disk trays each of which has a stepped flange with a holed protrusion on one end and a thin flexible flat slab angularly extending from a peripheral surface; and

two fastening elements passing through said pin hole respectively from the top of said housing to the bottom; and characterized in that said housing is fixed in the opening of said front panel by barbed fingers and said compact disk trays are stacked pivotally joined together by said fastening elements passing through the holed protrusion of each tray, is secured in the housing by said curved ledge retaining the thin flexible flat slab.

5,813,741
ADJUSTABLE SHELF FOR A REFRIGERATOR
Edison Allen Fish; Thomas R. Swindell, both of Greenville, Mich.; Randall Sandlin, Columbus; Russell George Patterson, III, Dublin, both of Ohio; Daniel James Ocharzak, and Robert Henry Martin, both of Columbus, Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jan. 23, 1996, Ser. No. 590,137
Int. Cl.[6] A47B *96/04*
U.S. Cl. 312—408 **36 Claims**



1. A refrigerator shelf support assembly, comprising:

first and second mounting rails;

first and second lateral support brackets, said first lateral support bracket having a proximal end removably secured to the first mounting rail, said second lateral support bracket having a proximal end removably secured to the second mounting rail;

a support member having a first terminal end attached to said first lateral support bracket and an opposite, second terminal end attached to said second lateral support bracket;

a central support bracket having a proximal end attached to said support member intermediate said first and second lateral support brackets and extending outwardly from said support member, wherein said central support bracket cooperates with said first and second lateral support brackets to define a support frame adapted to movably support a plurality of shelves in a side-by-side manner.

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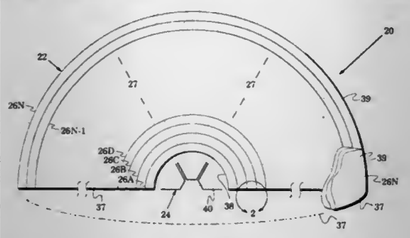
5,813,742

LAYERED DISPLAY SYSTEM AND METHOD FOR VOLUMETRIC PRESENTATION

Ronald S. Gold, Fullerton, and Jerry E. Freeman, Irvine, both of Calif., assignors to Hughes Electronics, El Segundo, Calif.

Filed Apr. 22, 1996, Ser. No. 636,197
Int. Cl.[6] G03B *21/14*
U.S. Cl. 353—88 27 Claims



1. A volumetric display system, comprising:

a hemispheric-shaped display member having a plurality of electrically-responsive optical shutters which each has a translucent state and a transmissive state and wherein said optical shutters are arranged in a layered relationship; and

a projection system having at least one image source and configured to project successive images on said optical shutters;

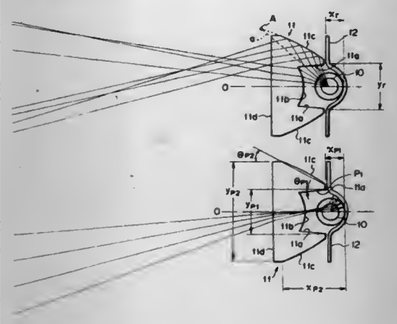
each of said optical shutters displaying selected ones of said images by being placed in said translucent state while others of said optical shutters are placed in their transmissive states.

5,813,743

LIGHTING UNIT

Yoji Naka, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Mar. 26, 1996, Ser. No. 621,935
Claims priority, application Japan, Mar. 27, 1995, 7-068194; Mar. 27, 1995, 7-068195
Int. Cl.[6] G03B *15/02*
U.S. Cl. 362—16 14 Claims



1. A lighting unit for controlling the direction of emitted light comprising:

a light source having a transparent portion which is approximately spherical in shape;

a refracting solid disposed adjacent to the light source such that the refracting solid is entirely forward in a light emanating direction of a center of the transparent portion of the light source, the refracting solid comprising:

a first light incident surface having a frustoconical shape whose axis of symmetry is an optical axis of the lighting unit, a larger circumference of which faces the light source, and a smaller circumference of which faces away from the light source;

a second light incident surface having a smoothly curved face and a clearly defined, circular perimeter defined by the smaller circumference of the first light incident surface, the second light incident surface presenting a convex face to the light source;

a total reflecting surface surrounding the first and second light incident surfaces; and

a light emanating surface; and

a reflecting mirror disposed adjacent to the light source and opposite the refracting solid;

wherein light emanated from the light source toward the reflecting mirror is reflected toward the refracting solid, light reaching the first incident surface is refracted toward the total reflecting surface and reflected toward the light emanating surface, light reaching the second light incident surface is refracted toward the emanating surface;

wherein the first and second light incident surfaces represent the only refracting surfaces receiving light from the light source; and

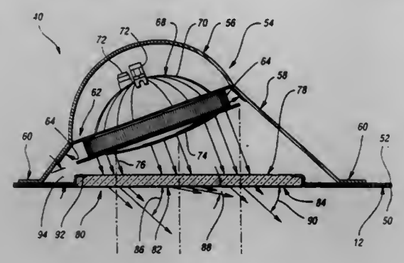
wherein the first light incident surface is angled with respect to the optical axis in the range of 2° to 13°.

5,813,744

AIRCRAFT GROUND FLOODLIGHT

Krikor Altebarmakian, Long Beach, Calif., assignor to McDonnell Douglas Corp., Hazelwood, Mo.

Filed Mar. 17, 1997, Ser. No. 819,849
Int. Cl.[6] B64D *47/02*
U.S. Cl. 362—62 12 Claims



1. A ground floodlight for an aircraft having a fuselage including a forward cargo door, the ground floodlight comprising:

a housing adapted for mounting to the fuselage;

a lamp connected to the housing at an angle relative to the fuselage; and

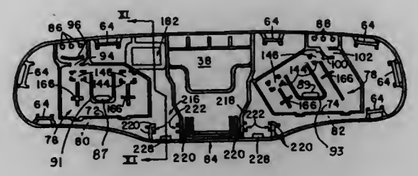
a generally flat lens for mounting substantially flush with an outer surface of the fuselage, the lens having a first region for directing light from the lamp toward the forward cargo door to illuminate an area beginning about four feet from the cargo door to provide adequate lighting during loading and unloading of the aircraft and a second region for directing light from the lamp generally forward to illuminate ground in front of the aircraft.

5,813,745

REARVIEW MIRROR WITH LIGHTING ASSEMBLY

Howard W. Fant, Jr., Grand Haven, Mich.; Troy L. Vanderhoof, Plano, Tex.; Craig M. Miller, Jenison, and Barry W. Hutzel, Holland, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Continuation of Ser. No. 945,238, Sep. 15, 1992, abandoned, which is a division of Ser. No. 760,007, Sep. 13, 1991, Pat. No. 5,178,448. This application Oct. 31, 1994, Ser. No. 332,429
Int. Cl.[6] B60Q *3/02*
U.S. Cl. 362—83.1 58 Claims



1. A rearview mirror assembly for vehicles comprising:

a mirror element;

a case supporting and retaining said mirror element;

said mirror element having a viewing surface and a rear surface opposite to said viewing surface;

a lamp compartment, said lamp compartment being inside said assembly;

said case having a bottom portion and an opening in said bottom portion, said compartment being positioned rearwardly of said mirror element, said opening also being positioned rearwardly of said mirror element and having a periphery and an edge defining said periphery of said opening;

a lamp located in said compartment and adapted to project light through said opening; and

ventilation means for removing heat from said compartment, said ventilation means positioned rearwardly of said mirror element and including an air passageway in communication with said compartment along at least a portion of said periphery of said opening, and at least one vent hole in communication with said compartment, said at least one vent hole being spaced from said air passageway at another location on said case, said ventilation means providing a ventilation passageway through said air passageway, through said compartment, and through said at least one vent hole;

said lamp including a reflector, a light bulb positioned between said reflector and said opening, at least one bulb holder mounted adjacent said reflector for holding said light bulb, and a lens positioned in said opening, said air passageway extending around at least a portion of said lens.

5,813,746

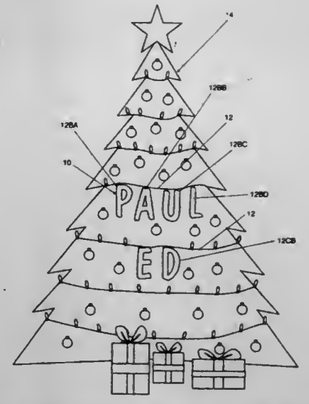
Patent Not Issued For This Number

5,813,747

CHRISTMAS TREE LIGHTS

B. J. Kale, 1625 Rosewell Rd., #432, Marietta, Ga. 30062

Filed May 30, 1997, Ser. No. 866,746
Int. Cl.[6] F21P *1/02*
U.S. Cl. 362—123 8 Claims



1. A decorative light set (10) comprising:

A) a wire (12) connected to a power means;

B) a plurality of wire lights (12A) electrically spliced within the wire (12); and

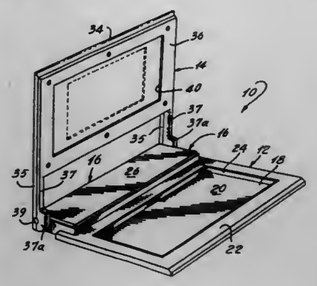
C) at least one light housing which comprises an opening therein within which one of said wire lights (12A) is removably inserted, and wherein the light housing is a letter and is manufactured from a transparent or translucent material.

5,813,748

ILLUIMINATED TRANSACTION TRAY

Peter Nicholas Maxymych, 4700 St. Catherine Street West, Suite 606, Westmount, Montreal, Quebec, Canada, H3Z 1S6

Filed Mar. 25, 1997, Ser. No. 823,161
Int. Cl.[6] F21V *33/00*
U.S. Cl. 362—154 6 Claims



1. A transaction tray comprising a tray portion and a hinged lid portion, the tray portion having a transaction compartment and a storage compartment, lighting means associated with the transaction compartment, the lid portion having a flat outer surface and a parallel inner surface, a first transparent window in the outer surface of the lid and a second transparent window in the inner surface, a first translucent intelligence bearing substrate displayed in the first window and a second translucent intelligence bearing substrate displayed in the second window, and a lighting means between the first and second translucent substrates whereby the transaction tray will be lit by the lighting means and the translucent substrates will be displayed and backlit from both sides of the hinged lid.

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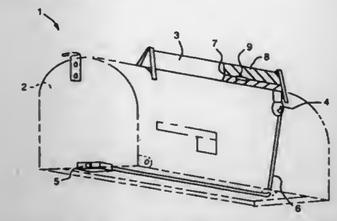
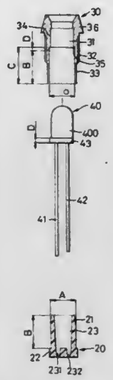
5,813,749
SOLAR POWERED MAILBOX INTERNAL LIGHT
David W. Sheldon, 14A Mason Rd., Brookline, N.H. 03033
Filed Dec. 20, 1996, Ser. No. 772,103
Int. Cl.[6] F21V *33/00*
U.S. Cl. 362—155 **14 Claims**



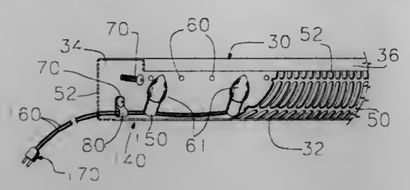
1. Apparatus for lighting the interior of a mailbox including closure door with an illumination means located in the interior of said mailbox, electrical energy providing means, and means for sensing when said mailbox closure door is opened to enable said electrical energy providing means to provide electrical energy to said illumination means and thereby illuminate the interior of said mailbox, wherein the improvement comprises mounting said sensing means underneath said mailbox adjacent to said closure door so that said sensing means does not enable said electrical energy providing means to provide electrical energy to said illumination means until said closure door is substantially fully opened.

5,813,750
INDICATING LAMP
Tien-Ming Chou, No. 41, Shan-Hsi-Wu St., Pei Dist., Taichung City, Taiwan
Filed May 29, 1997, Ser. No. 865,188
Int. Cl.[6] H01R *33/06*
U.S. Cl. 362—226 **2 Claims**



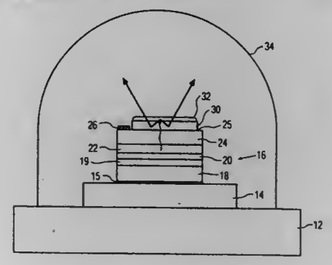
1. An indicating lamp including:
a base having a pin hole unit that includes two aligned pin holes formed in said base;
a lamp member including a generally cylindrical lamp body that has a lower end formed with an outwardly extending flange, and an electrode pin unit that includes a positive electrode pin and a negative electrode pin which have upper ends connected fixedly to said lower end of said lamp body and which are respectively inserted into said pin holes of said base; and
a sleeve having a central hole formed therethrough, a large-inner-diameter lower end portion and a small-inner-diameter upper portion a shoulder defined between inner surfaces of said end portions, said large-inner-diameter lower end portion having an inner diameter larger than that of said small-inner-diameter upper portion, said flange of said lamp member having an outer diameter which is smaller than the inner diameter of said large-inner-diameter lower end portion of said sleeve, said small-inner-diameter upper end portion of said sleeve having an inner diameter smaller than the outer diameter of said flange, said base having a lower end portion and an upper insert end portion which is press fitted within said lower end portion of said sleeve in such a manner that said lamp body is received within said small-inner-diameter upper portion of said sleeve and is visible from an upper end of said central hole of said sleeve, and that said flange of said lamp member is located within said large-inner-diameter lower end portion of said sleeve;
wherein said base is made of a flexible electrically insulating material, said large-inner-diameter lower end portion of said sleeve having a length which is equal to total length of said flange of said lamp body and said upper insert end portion of said base, total length of said flange of said lamp body and said base being larger than the length of said large-inner-diameter lower end portion of said sleeve, said upper insert end portion of said base having at least a portion which has an outer diameter slightly larger than the inner diameter of said large-inner-diameter lower end portion of said sleeve, said flange having an upper end abutting against said shoulder of said sleeve, and a lower end abutting against an upper end of said base.

5,813,751
DEVICE FOR PERMANENT INSTALLATION OF CHRISTMAS LIGHTING
Robert G. Shaffer, P.O. Box 3148, Lacey, Wash. 95809-3148
Filed Jan. 15, 1997, Ser. No. 784,031
Int. Cl.[6] F21V *21/00;* **F21S** *3/00*
U.S. Cl. 362—249 **3 Claims**



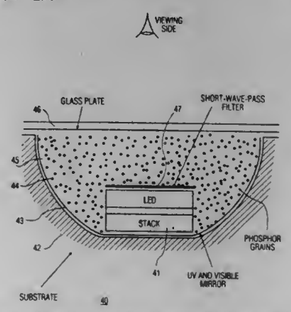
1. A device for permanent installation of Christmas lighting on an exterior surface of a building or structure, comprising:
a horizontal top and bottom wall joined by a vertical rear wall, and a front wall depending from the top wall, the top wall having a depth larger than the depth of the bottom wall, the rear wall having a height greater than the height of the front wall, and the top, bottom, rear and front walls being horizontally elongated, thereby defining a channel and a channel recess for receiving and housing said Christmas lighting;
a removable, flexible, rectangular screen covering the channel recess and having a length equal to the length of the recess and having top and bottom edges, which screen, by deformation from a planar configuration, is insertable into the channel recess such that the upper edge engages an inside surface of the front wall and the lower edge engages an inside surface of the bottom wall; and
a plurality of fasteners attached to at least one wall of the device for attaching the device to an exterior surface of a building or structure; wherein a wall of the device which is opposite said at least one wall is provided with a plurality of access holes in register with said plurality of fasteners.

5,813,752
UV/BLUE LED-PHOSPHOR DEVICE WITH SHORT WAVE PASS, LONG WAVE PASS BAND PASS AND PEROIT FILTERS
Barry Singer, New York, N.Y.; Cornelis R. Ronda, Aachen, Germany, and Leendert Vriens, BA Eindhoven, Netherlands, assignors to Philips Electronics North America Corporation, New York, N.Y.
Filed May 27, 1997, Ser. No. 863,989
Int. Cl.[6] H04N *9/31*
U.S. Cl. 362—293 **12 Claims**



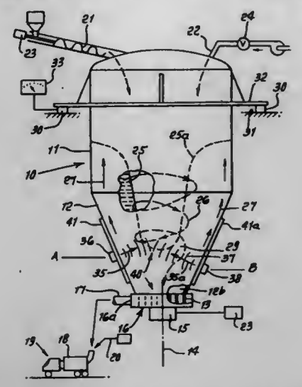
1. A visible light emitting device comprising: a UV and blue light emitting diode; a layer of a first short wave pass (SWP) filter on the upper surface of the LED; and a layer of a UV and blue excitable, visible light emitting phosphor on upper surface of the SWP filter.
2. The visible light emitting device of claim 1 in which a layer of a second short wave pass (SWP) filter is located on the upper surface of the phosphor layer.
4. The visible light emitting device of claim 2 in which a band pass (BP) filter is located on the upper surface of the phosphor layer.
8. The visible light emitting device of claim 4, in which the BP filter is a multilayer structure of alternately high and low index materials.

5,813,753
UV/BLUE LED-PHOSPHOR DEVICE WITH EFFICIENT CONVERSION OF UV/BLUES LIGHT TO VISIBLE LIGHT
Leendert Vriens; Gerard Acket, both of Eindhoven, Netherlands, and Cornelis Ronda, Aachen, Germany, assignors to Philips Electronics North America Corporation, New York, N.Y.
Filed May 27, 1997, Ser. No. 863,987
Int. Cl.[6] H04N *9/31*
U.S. Cl. 362—293 **16 Claims**



1. A visible light emitting device comprising: a supporting body having an upper surface with a depression having an opening in the upper surface; a UV and blue and visible light-reflecting layer on the surface of the depression; a UV and blue light emitting diode (UV and blue LED) centrally located on the light reflecting layer; the LED having an active region with a first index of refraction; particles of a visible light emitting phosphor surrounding the sides and top of the LED; and a UV and blue and visible light transmitting material surrounding the LED and filling the depression, the UV and blue and visible light transmitting material having a second index of refraction lower than the said first index of refraction.
4. The visible light emitting device of claim 1 in which a UV and blue light-absorbing, visible-light transmitting plate covers the opening of the depression.
9. The visible light emitting device of claim 4 in which a LWP, SWP or BP filter is located on the lower surface of the plate.

5,813,754
VIBRATION INPUT TO MOVING AQUEOUS CEMETITIOUS SLURRY
Richard A. Williams, Dana Point, Calif., assignor to Matrix Master, Inc., Costa Mesa, Calif.
Filed Mar. 13, 1996, Ser. No. 615,597
Int. Cl.[6] B28C *5/16;* **B01F** *11/00*
U.S. Cl. 366—6 **40 Claims**



24. In apparatus for treating an aqueous, cementitious slurry, the slurry consisting essentially of water and Portland cement, the combination that includes:
a) a container for the slurry and means effecting movement of the slurry, in the container, and
b) vibrator means coupled with the container and operated at a frequency for transmitting sufficient vibration to the moving slurry to lower the water/cement ratio to about 0.30 for water temperature from below 100° F. up to 190° F. and to enhance fluidity of the slurry,
c) the slurry consisting essentially of water and Portland cement, and sufficient vibration being transmitted into the moving slurry to lower the water/cement ratio to about 0.30 for water temperature from below 100° F. up to 190° F.

5,813,755
SINGLE BLADE WHISK
Mary-Elizabeth Proshan, 301 N. Harrison St., Princeton, N.J. 08540
Filed Nov. 25, 1996, Ser. No. 757,006
Int. Cl.[6] A47J *43/10*
U.S. Cl. 366—129 **3 Claims**
1. A whisk comprising:

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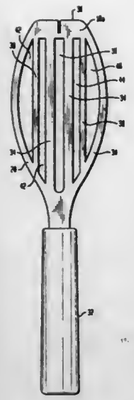
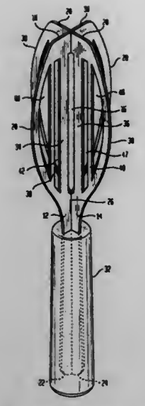




a flat, thin, somewhat flexible elongated member having a longitudinally extending centrally disposed axis of symmetry;

the member having first and second opposite ends;

the first and lower end of the member being flat, relatively long and disposed at right angles to the axis of symmetry to define a horizontal extension disposed in a horizontal plane at right angles to the axis of symmetry;

the second and upper end of the member being relatively short and extending longitudinally from a common position on the member which is located between said first and second ends;

the axis of symmetry being defined by a longitudinally extending centrally disposed slot which extends between the extension and said common position;

the member having opposite sides of like convex curvature which extend outwardly and downwardly from opposite ends of each horizontal extension to said common position;

the member having a first pair of longitudinal slots which are disposed symmetrically on opposite sides of the slot defining the axis of symmetry and a first pair of longitudinal bars, each one of the first pair of bars being disposed between the slot defining the axis of symmetry and a corresponding one of the first pair of longitudinal slots;

the member having a second pair of longitudinal slots, each slot in the second pair being disposed adjacent a corresponding one of said curved sides, and a second pair of longitudinal bars, each bar in the second pair being disposed between a corresponding one of the first pair of slots and a corresponding one of the second pair of slots.

5,813,756

MULTIBLADE WHISK

Mary-Elizabeth Proshan, 301 N. Harrison St., Princeton, N.J. 08540

Filed Nov. 25, 1996, Ser. No. 757,007
Int. Cl.[6] A47J *43/10*
U.S. Cl. 366—129 **9 Claims**

1. A whisk comprising:

first and second members having the same shape and size, each member being a flat, thin, somewhat flexible elongated element having a longitudinally extending centrally disposed axis of symmetry;

said elements being connected together so that their axes of symmetry are coincident;

each element having first and second opposite ends;

the first and lower end of each element being flat, relatively long and disposed at right angles to the axes of symmetry to define a horizontal extension, the extensions of both elements intersecting in a common horizontal plane disposed at right angles to the axes of symmetry;

the second and upper ends of both elements being relatively short and extending longitudinally from a common position on each member which is located between said first and second ends;

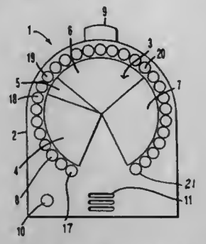
each element having opposite sides of like convex curvature which extend outwardly and downwardly from opposite ends of each horizontal extension to said common position.

5,813,757

COMPACT ELECTRONIC TIMING DEVICE

Michael Antony Tuke, Surrey, United Kingdom, assignor to Finsbury (Instruments) Limited, Surrey, United Kingdom

Filed Dec. 11, 1996, Ser. No. 763,481
Claims priority, application United Kingdom, Dec. 12, 1995, 9525397
Int. Cl.[6] B01F *15/00;* **G04B** *47/06;* **G01K** *1/02*
U.S. Cl. 366—142 **12 Claims**



1. A compact electronic timing device for indicating procedural steps to be taken during the setting of a settable bone cement mixture which is to be formed by mixing two or more components in a mixing zone separate from the device, which mixture passes through a plurality of successive stages from mixing to setting, at least one stage having a duration which is temperature dependent, the device comprising:

a display having a plurality of separate portions, each portion corresponding to a stage through which the mixture is to pass;

a timer having a manually operable starter;

indicator means operatively linked with the timer and disposed in each separate portion of the display for indicating the lapse of time during each stage;

temperature sensing means for sensing the ambient temperature in the environment of mixing; and

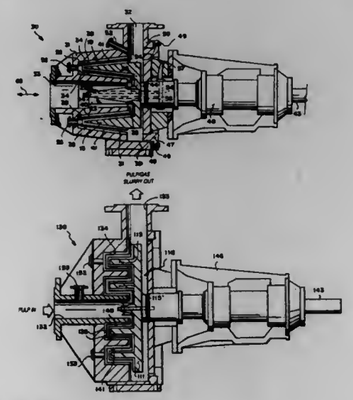
control means arranged to receive data from the temperature sensing means and data from the timer, and arranged to provide an output, responsive to the received data, for controlling the indicator means, such that the indication of the lapse of time during at least one of the stages is dependent upon the ambient temperature.

5,813,758

CONCENTRIC RING FLUIDIZING MIXER

Thomas R. Delcourt, Queensbury, N.Y.; Johan Gullichsen, Siuntio, Finland; Ronald G. Bain, S. Glens Falls, and C. Bertil Stromberg, Glens Falls, both of N.Y., assignors to Ahlstrom Machinery Inc., Glens Falls, N.Y.

Filed Dec. 10, 1993, Ser. No. 164,889
Int. Cl.[6] B01F *5/04*
U.S. Cl. 366—171.1 **16 Claims**



1. A mixer comprising:

a housing having an inlet for pulp and an outlet;

a rotor and a stator disposed in said housing, said rotor and stator having complimentary shaped cooperating surfaces spaced to define annular mixing volumes;

a rotary drive mechanism having a drive shaft, for rotating said drive shaft;

said rotor connected to said drive mechanism drive shaft, said drive mechanism rotating said rotor about an axis of rotation;

means for mounting said stator with respect to said rotor so that the spacing between said cooperating surfaces is 0.5 inches or less substantially throughout said annular mixing volumes;

said rotor comprising: a substantially disc-shaped base having a center about which said rotor can rotate, and a diameter; a hub at said center of said base for connecting said base to said rotary drive mechanism; a first ring substantially concentric with said base and extending outwardly from said base; a plurality of blades extending radially through said center and along the contour of said first ring, and said blades extending outwardly from said base and said ring; and

wherein said stator has a plurality of radially extending blades complimentary to said rotor blades.

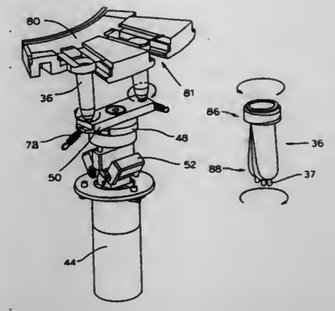
5,813,759

METHOD AND APPARATUS FOR VORTEX MIXING USING CENTRIFUGAL FORCE

Peter Louis Gebrian, Wilmington, Del., assignor to Dade International Inc., Deerfield, Ill.

Filed Jul. 3, 1996, Ser. No. 675,130
Int. Cl.[6] B01F *9/00; 11/00*
U.S. Cl. 366—208 **7 Claims**

4. A vortex mixer for mixing a liquid in a container, the container having upper and lower portions, the apparatus comprising:



a container engagement bar disposed below the container and engaging the lower portion of said container;

a horizontal swing-cam attached to the engagement bar and adapted to provide horizontal displacement of the engagement bar;

a pair of vertical swing-cams attached to the engagement bar and adapted to provide vertical displacement of the engagement bar; and,

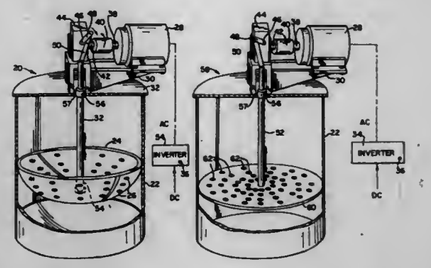
a source of centrifugal force connected to said engagement bar.

5,813,760

RECIPROCATING MIX TANK AGITATOR AND PROCESS FOR MIXING THE LIQUID CONTENTS OF THE TANK

Christopher L. Strong, Littleton, Colo., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Oct. 24, 1996, Ser. No. 736,572
Int. Cl.[6] B01F *11/00*
U.S. Cl. 366—258 **20 Claims**



1. A process for mixing the liquid contents of a tank without foaming and aeration comprising the steps of:

providing a shaft;

providing an agitator paddle at one end of said shaft having first and second sides, a center region, a perimeter, and a plurality of passages extending from the first side to the second side, wherein the passages are disposed radially between locations proximate the center region and locations proximate the perimeter;

providing a motor coupled to an opposite end of said shaft to reciprocate said agitator paddle in directions generally along paths through said passages,

wherein said agitator paddle is adapted to be extended through an opening to the tank on the one end of said shaft, with the opposite end of said shaft being to the exterior of the tank;

and reciprocating said paddle at a sufficiently slow reciprocation rate to substantially prevent foaming and aeration of the liquid contents in the tank.

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5,813,761

AGITATOR PADDLE ROTOR FOR MASH KETTLES

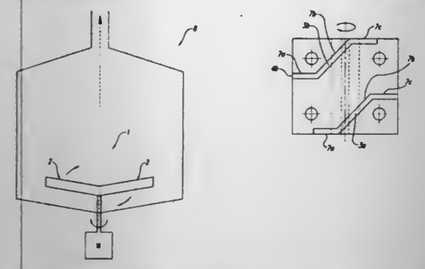
Simon Redl, Reichertshausen, Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Germany

Filed Oct. 29, 1996, Ser. No. 739,678

Claims priority, application Germany, Oct. 30, 1995, 295 17 343.2

Int. Cl.[6] C12C *7/06;* **B01F** *7/20*

U.S. Cl. 366—314 **9 Claims**



1. An agitator paddle rotor for mash kettles for use in brewing, said rotor being rotatingly arranged above the bottom of said mash kettle and comprising at least two radially extending agitator paddles, of which each comprises at least one obliquely oriented paddle section relative to a direction of rotation of said rotor, at least one of said paddle sections comprises a front paddle portion which is the front one in rotational direction and ends substantially in parallel with the bottom of said mesh kettle, and upwardly oriented central paddle portion which is connected to the front paddle portion and is steeper than the front paddle portion, as well as a rear paddle portion which is connected to the central paddle portion and is the rear one in the rotational direction and oriented substantially parallel with the bottom of said mash kettle, the at least one paddle section has opposing first and second ends, and each agitator paddle includes at least one vertical distributor plate connected to the at least one paddle section at a position between the first and second ends.

5,813,762

MIXER TUBE FOR LOW VISCOSITY FLUIDS

Markus Fleischli, Winterhur; Gottlieb Schneider, Seuzach, and Marc Bruno Wehrli, Winterhur, all of Switzerland, assignors to Sulzer Chemtech AG, Winterhur, Switzerland

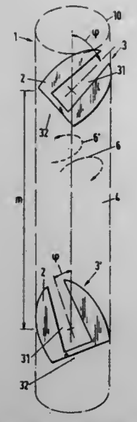
Filed Feb. 28, 1997, Ser. No. 808,380

Claims priority, application European Pat. Off., Apr. 12, 1996, 96810224

Int. Cl.[6] B01F *5/06*

U.S. Cl. 366—337 **29 Claims**

1. Mixer tube having a tube wall and a tube cross-section defining a tube axis for low viscosity fluid flow, the mixer tube comprising a plurality of plate-like elements which block off a cross-section of the mixer tube at at least one region of the mixer tube, the plate-like elements having boundaries that define constrictions which are open to fluid flow in a direction of flow through the mixer tube, the plate-like elements comprising at least one set of plate-like elements which are disposed at a level along the tube axis of the mixer tube and which define a mixing path downstream of the set of plate-like elements, the constrictions for the at least one set of plate-like elements including a gap-shaped region bordering the plate-like elements and extending from a portion of the tube wall through the tube axis and subtending an angle relative to the tube axis which ranges from about 20° to 60°,



the tube cross-section being generally circular with a tube diameter, wherein the mixing path ranges from 1–10 times the tube diameter.

5,813,763

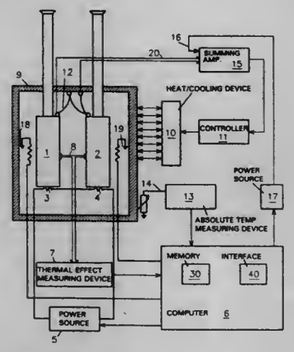
ULTRASENSITIVE DIFFERENTIAL MICROCALORIMETER

Valerian V. Plotnikov, Sunderland; John F. Brandts, Leeds, and J. Michael Brandts, Holyoke, all of Mass., assignors to Microcal Incorporated, Northhampton, Mass.

Filed Oct. 11, 1996, Ser. No. 729,433

Int. Cl.[6] G01N *25/20*

U.S. Cl. 374—11 **17 Claims**



1. A calorimeter comprising:

a sample cell;

a reference cell;

a thermal shield surrounding said sample and reference cells;

a heating device thermally coupled to the thermal shield;

a first temperature sensor which monitors a temperature of the thermal shield;

a second temperature sensor which monitors a temperature differential between the thermal shield and at least one of the sample and reference cells;

a control system which has an output line connected to the heating device and which has a first input line and a second input line, wherein the first temperature sensor supplies a first signal to the first input line, the second temperature sensor supplies a second signal to the second input line, and wherein

the control system is configured to generate on its output line an output signal which is a function of both the first and second signals.

5,813,764

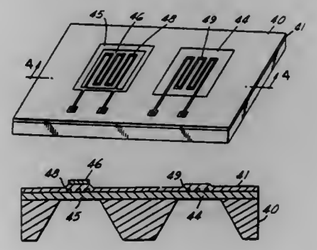
CATALYTIC DIFFERENTIAL CALORIMETRIC GAS SENSOR

Jacobus Hendrik Visser, Southfield; Chaitanya Kumar Narula, Ann Arbor, and Margherita Zanini-Fisher, Bloomfield Township, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Division of Ser. No. 311,299, Sep. 23, 1994, Pat. No. 5,707,148. This application Sep. 29, 1997, Ser. No. 940,144

Int. Cl.[6] G01N *25/20;* **G01K** *17/00*

U.S. Cl. 374—12 **5 Claims**



1. A differential gas combustible microcalorimeter sensor comprising:

a substrate which comprises:

a silicon frame,

a first reference membrane disposed on said silicon frame, and

a second membrane disposed on said silicon frame, said second membrane being positioned such that said second membrane is thermally isolated from said first reference membrane;

a first and second temperature measuring devices, the first temperature measuring device being disposed on said first reference membrane and the second temperature measuring device being disposed on said second membrane; and

a sol-gel processed catalytic layer disposed on said second temperature measuring device, wherein said first and second temperature measuring devices provide a measurement of the additional heat generated by the catalytic layer to provide a means of calculating the temperature fluctuation in a combustible gas that comes into contact with the sensor.

5,813,765

EXTERIOR TEMPERATURE SENSOR ON ANTENNA FINIAL

Christopher Edward Peel, Noblesville; Robert Julius Pinto, Kokomo, and Myron Glen Padgett, Greentown, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jan. 13, 1997, Ser. No. 783,842

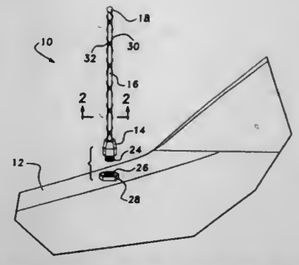
Int. Cl.[6] G01K *1/14;13/00*

U.S. Cl. 374—141 **19 Claims**

1. A temperature sensing system for sensing ambient air temperature around a vehicle, said system comprising:

a sensing element, said sensing element positioned within a finial of a mast antenna connected to the vehicle;

a sensor lead electrically connected to the sensing element and extending down a mast of the antenna, said sensor lead being electrically connected to an antenna base at an end of the mast opposite to the finial; and



an interface circuit, said interface circuit being responsive to a sensor signal from the sensor lead, and processing the sensor signal to provide a temperature signal indicative of the ambient air temperature.

5,813,766

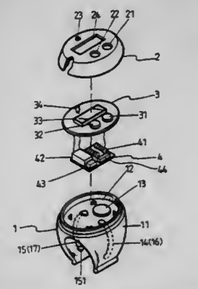
FINGER TEMPERATURE INDICATING RING

Mei-Yen Chen, 3rd Floor, No. 16-4, Lane 10, Chung Hwa Road, Yung Kang City, Tainan Hsien, Taiwan

Filed Aug. 12, 1997, Ser. No. 909,886

Int. Cl.[6] G01K *1/14;1/16;7/22;* **G08B** *23/00*

U.S. Cl. 374—141 **2 Claims**



1. A finger temperature indicating ring for indicating a physically or mentally relaxed condition of a wearer, comprising:

a ring body including a band portion having a lower opening forming two lower ends of said ring body, and two symmetric channels circumferentially embedded in two opposite sides of said band portion to respectively receive an arcuated thermal conductive rod and an arcuated discharge rod therein, said thermal conductive rod and said discharge rod having lower ends which respectively project from an inner side of said two lower ends of said ring body, forming two exposed ends to touch an outer periphery of the wearer's finger when said finger temperature indicating ring is worn around the wearer's finger; and said band portion having a shallow top recess for accommodating electronic elements of said ring therein;

a top cover having a contour corresponding to a contour of said top recess on said ring body for fitly covering said ring body and engaging with said top recess, and said top cover being formed at a top surface with several openings;

a top panel being disposed in a space defined between said top cover and said top recess of said ring body, said top panel being provided at an upper surface with a switch button, an on/off button, a liquid crystal display, and an LED which respectively project from said openings formed on said top cover; and

a circuit board electrically connected to a bottom side of said top panal and including a thermistor, an indicating element, and other relevant electronic elements; wherein said thermistor is connected to a top end of said thermal conductive rod and

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may therefore sense a finger temperature of the wearer via said exposed end of said thermal conductive rod and actuate an operation in said circuit board to convert said finger temperature sensed by said thermistor into a signal, said signal corresponding to said physically or mentally relaxed condition of the wearer and being sent to said indicating element which presents said signal to the wearer in at least one of the following manners selected via said switch button on said top panel:

a. causing said discharge rod to discharge a small amount of electric current strong enough for the ring wearer to perceive it;

b. causing said liquid crystal display to show a value of said finger temperature sensed by said thermistor;

c. causing said LED to emit light; or

d. warning the ring wearer by other equivalent element.

5,813,767

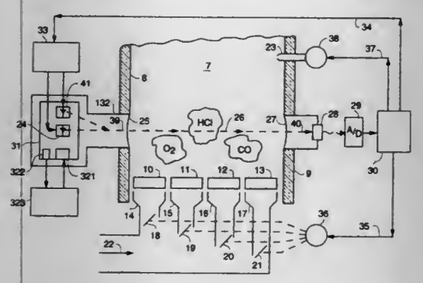
SYSTEM AND A METHOD FOR MONITORING COMBUSTION AND POLLUTANTS IN A THERMAL PLANT BY MEANS OF LASER DIODES

Bruno Calabro'; Luis Frontini, both of Genoa, and Francesco Repetto, Cogoleto, all of Italy, assignors to Finmeccanica S.p.A. Azienda Ansaldo, Italy

Filed Sep. 6, 1996, Ser. No. 707,805

Int. Cl.[6] G01K *1/08*

U.S. Cl. 374—142 **10 Claims**



1. A system for monitoring a combustion process with the development of pollutant substances in the combustion fumes in a combustion chamber, comprising:

at least one longitudinal single mode laser diode emitting radiation at a wavelength corresponding to that of a predetermined spectral absorption line of a predetermined chemical species,

modulation means for periodically modulating the wavelength of radiation emitted in a region surrounding that of said absorption line,

conveyor means for directing the radiation along a transit path through the combustion chamber,

collector means for receiving a fraction of the radiation which has not been absorbed along the transit path and for conveying it to detection means comprising at least one radiation sensor, the radiation sensor generating a signal correlated to the intensity of the radiation fraction, and

processing means connected to the detection means for identifying jointly, in dependence on the signal received by the detection means, sampled at successive moments and describing the shape of said spectral absorption line, the temperature of the combustion fumes passed through along the transit path and the concentration of the predetermined chemical species.

5,813,768

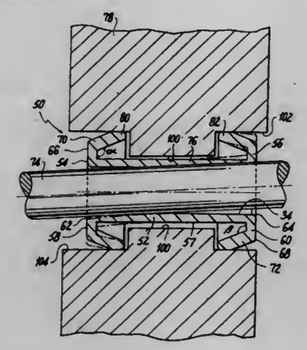
SELF-ALIGNING BEARING STRUCTURE

Gregory S. Lyon, Mamaroneck, N.Y., assignor to Thomson Industries, Inc., Port Washington, N.Y.

Filed May 16, 1997, Ser. No. 857,575

Int. Cl.[6] F16C *23/00*

U.S. Cl. 384—192 **14 Claims**



1. A bearing liner comprising:

a hollow, substantially cylindrical shaped member having two ends and an intermediate portion;

a flange extending circumferentially and projecting radially from each of said two ends, each flange having a proximal end and a distal end; and

a flexible frustoconical member mounted adjacent said distal end of each of said flanges, said frustoconical member extending circumferentially and projecting outwardly from said flange.

5,813,769

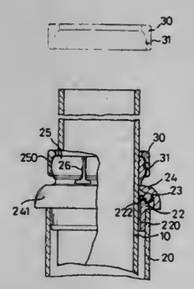
STEERING BEARING ASSEMBLY FOR A BICYCLE

Hung-Che Chneh, 3rd Flr., No. 398, Ta Tun 6th St., Taichung, Taiwan

Filed Jul. 21, 1997, Ser. No. 897,481

Int. Cl.[6] F16C *33/58*

U.S. Cl. 384—513 **3 Claims**



1. A steering bearing assembly for a bicycle which comprises a frame having a head tube and a steerer tube extending through said head tube with said steering bearing assembly being disposed between said head tube and said steerer tube, a handlebar stem mounted to said steerer tube extending from said head tube, said steering bearing assembly comprising:

a lower race, said lower race having a flange extending radially from a top edge thereof so as to be disposed on one of two ends of said head tube;

an upper race having a skirt portion extending radially therefrom and a neck portion extending upwardly from said skirt portion, said neck portion having at least two gaps defined longitudinally therein;

a ball bearing set rotatably received between said skirt portion and said lower race, and

a fastener securely mounted to said neck portion and being pushed downwardly by said handlebar stem to position said steerer tube extending through said neck portion.

5,813,770

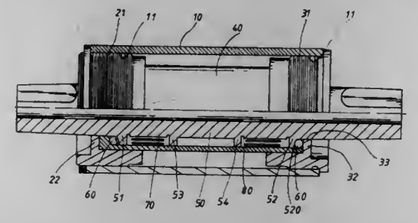
HUB OF A BICYCLE

Douglas Chiang, 2F, 903, Shiang Sin South Rd., Taichung, Taiwan

Filed Sep. 19, 1995, Ser. No. 529,998

Int. Cl.[6] F16C *19/49;* **B60B** *27/00*

U.S. Cl. 384—545 **2 Claims**



1. A hub of a bicycle comprising:

a hub shell, said hub shell having a first end and a second end, each of said first end and said second end having a threaded portion defined in an inner periphery thereof;

a first dust cap and a second dust cap, each of which having an outer threaded periphery defined in an outer periphery thereof for being threadedly engaged to said corresponding threaded portion of said hub shell respectively, each of said first and said second dust caps having a loop-like flange extending inwardly and radially from an inner periphery thereof and each of said loop-like flanges defining a first hole enclosed by said loop-like flanges respectively;

a sleeve having a first end and a second end, said first end thereof having a rim extending inwardly and radially from an inner periphery thereof so as to define a second hole enclosed by said rim, said second end of said sleeve being an open end, said sleeve disposed between said two loop-like flanges of said first and said second dust caps;

an axle having a first end and a second end, said axle having a first flange extending radially and outwardly therefrom near said first end, and having a second flange extending radially and outwardly therefrom near said second end, said first flange having a first groove defined in a side toward said first end of said axle and said second flange having a second groove defined in a side toward said second end of said axle, said axle received in said sleeve and having two bearings disposed between said axle and said sleeve, wherein one of said two bearings disposed between said first groove and said first loop-like flange and the other bearing disposed between said second groove and said second loop-like flange, at least a third flange and a fourth flange extending outwardly and radially from said axle and located between said first flange and said second flange, and

a first bearing disposed to said axle and located between said first flange and said third flange, a second bearing disposed to said axle and located between said second flange and said fourth flange.

5,813,771

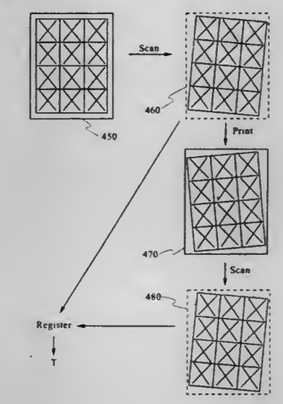
METHOD AND APPARATUS FOR PRINTER/SCANNER CALIBRATION

Shmuel Ur, Misgav, and Eyal Yair, Givot Elgh, both of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1996, Ser. No. 762,899

Int. Cl.[6] B41J *11/64*

U.S. Cl. 400—74 **9 Claims**



1. A method for calibrating a printer and/or a scanner so that information can be printed at a desired location with respect to a sheet, the method comprising:

storing a first set of markings as a first image in digital form;

printing, using a printer to be calibrated, the first image on a sheet to form a printed sheet;

scanning the printed sheet to generate a second image stored in digital form;

comparing the first image and the second image, or an image derived from the second image, to determine a first transformation which maps the first set of markings in the second image, or the image derived from the second image, onto the first set of markings on the first image;

storing parameters of the first transformation for subsequent use by applying the first transformation to information to be printed at the desired location;

storing a second set of markings as a third image in digital form;

printing the first set of markings on a sheet on which the second set of markings are printed at a known location to form a composite printed sheet;

comparing the second image and the third image to determine a second transformation which maps the second set of markings in the second image onto the second set of markings on the third image;

applying the second transformation to the second image;

subtracting the third image from the second image to generate a fourth image;

comparing the first image and the fourth image to determine the first transformation.

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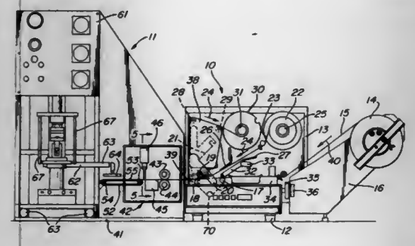
5,813,772

GARMENT LABELING SYSTEM, EQUIPMENT AND METHOD AND ELASTOMERIC LABEL FOR USE THEREWITH

Raymond H. Magill, Warminster; George T. Sellers, Jr., Philadelphia, both of Pa.; Ralph W. Grapentine, Paramus, and Wonnie Brown, Haledon, both of N.J., assignors to Avery Dennison Corporation, Pasadena, Calif.

Division of Ser. No. 482,635, Jun. 7, 1995, Pat. No. 5,658,647.
This application Apr. 28, 1997, Ser. No. 848,577
Int. Cl.[6] B65C *5/04;9/42;* B41F *1/08*
U.S. Cl. 400—120.01 7 Claims



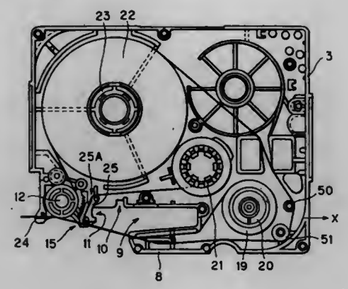
1. Equipment for feeding, printing, cutting and applying a garment label made from a portion of a strip of thermoplastic film, said equipment comprising a label printer and a label bonder in close proximity to each other and constructed and arranged to operate conjointly, the printer having a print head and having feeding means, comprising a platen roller, for handling film strip fed thereto from a supply roll of said film strip, said printer and feeding means being controlled by a controller circuit board so as to transit through a feed, print and cut cycle upon receipt of a signal from the label bonder, and thereby imprint a pre-programmed intelligence onto a first portion of the film strip, said imprinting being accomplished with the use of a thermal ink transfer ribbon fed thereto, said print head including means for selectively applying heat and pressure to transfer the image of said intelligence from said thermal ink transfer ribbon to said first portion of the film strip, said equipment further including sensing means for sensing the transit of said first portion of the imprinted film strip, cutter means for cutting said first portion of said imprinted film strip from the balance of said film strip, said cutter means being actuated by said controller circuit board in response to a signal transmitted from said sensing means so as to effect said cutting upon receiving a signal from said sensing means indicating the completion of the transit of said first portion of imprinted film strip, the bonder including a work platform comprising garment piece support means for positioning and supporting a garment piece to which a label is to be applied, the bonder further including signal means for transmitting a signal to said controller circuit board and thence to said feeding means, the equipment further including transfer means for transferring the cut imprinted portion of said label film from said printer to said bonder in a position in which said cut portion of label film is presented to one of a pair of opposed platens, said opposed platens being relatively movable, toward and away from each other, and positioned and arranged to apply heat and pressure, for a predetermined dwell time, so as to sandwich the garment piece and the cut label portion between the opposed platens and to apply and fusion bond the cut label portion to the garment piece substantially without distortion of the imprinted image.

5,813,773

TAPE CASSETTE

Takamitsu Kawai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 7, 1997, Ser. No. 795,133
Claims priority, application Japan, Feb. 16, 1996, 8-029115
Int. Cl.[6] B41J *35/28*
U.S. Cl. 400—207 26 Claims



1. A tape cassette detachably mounted to a printing device, said tape cassette housing an elongated tape in a wound-up condition, said elongated tape selected from a plurality of elongated tapes on which images are to be formed and having different characteristics including different thicknesses or different stiffnesses, the tape cassette further comprising:

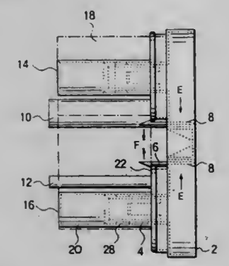
a plurality of pathways including a first pathway and a second pathway both leading from a first point to a second point, the first and second pathways being different pathways from each other, the elongated tape following a predetermined one of the first and second pathways corresponding to characteristics of the elongated tape.

5,813,774

TICKET-PRINTING DEVICE AND RIBBON ASSEMBLY ADAPTED FOR EASY RIBBON REPLACEMENT AND MODE SETTING

Sadao Sone; Shinji Sado, both of Tokyo, and Takahiro Amada, Takasaki, all of Japan, assignors to OKI Electric Industry Co., Ltd., Minato-ku, and OKI Information Systems, Co., Ltd., Takasaki, both of Japan

Filed Sep. 30, 1996, Ser. No. 723,802
Claims priority, application Japan, Oct. 18, 1995, 7-269927
Int. Cl.[6] B41J *33/02*
U.S. Cl. 400—250 14 Claims



1. A ribbon replacement assembly in combination with a ticket-printing device, said ribbon replacement assembly having an ink ribbon wound on a supply spool for installation on a supply spool shaft in said ticket-printing device, and a take-up spool for installation on a take-up spool shaft in said ticket-printing device, one end of said ink ribbon being attached to said take-up spool, said supply spool and said take-up spool having respective flanges, comprising:

ribbon fixture means for releasably holding said supply spool and said take-up spool in relative positions matching relative positions of said supply spool shaft and said take-up spool shaft, so that said supply spool and said take-up spool can be slipped onto said supply spool shaft and said take-up spool shaft while held in said ribbon fixture means, then released from said ribbon fixture means, allowing said ribbon fixture means to be withdrawn from said ticket-printing device while leaving said supply spool, said take-up spool, and said ink ribbon installed in said ticket-printing device,

wherein said ribbon fixture means includes a pair of flexible members with projecting tips for restraining said flanges of said supply spool and said take-up spool, said flexible members being disposed between said supply spool and said take-up spool, said supply spool and said take-up spool being released from said ribbon fixture means by inward pressure on said flexible members, causing said projecting tips to disengage from said flanges.

5,813,775

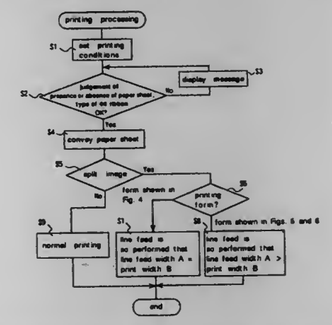
Patent Not Issued For This Number

5,813,776

PRINTING METHOD AND PRINTING APPARATUS USING SPLIT SEAL PAPER SHEETS

Susumu Fujiwara; Toshiyuki Watanabe, both of Gifu; Yoshiaki Ishikawa; Mikio Ichihashi, both of Hashima; Shigeki Shibuya, and Nobuo Iwatsuki, both of Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Nov. 5, 1997, Ser. No. 964,830
Claims priority, application Japan, Nov. 14, 1996, 8-302646; Feb. 12, 1997, 9-027965
Int. Cl.[6] B41J *21/16*
U.S. Cl. 400—279 16 Claims



1. A printing method using a split seal paper sheet, wherein

a split seal paper sheet in which the width of split seals composing the split seal paper sheet in the direction of conveyance of the paper sheet is smaller than the print width of a serial head is used,

one or more of said split seals is/are positioned in one scanning region of said serial head, to print an image on the split seals, and

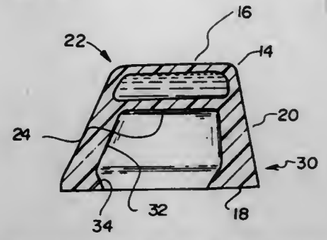
line feed for printing on one or more split seals in the subsequent line is performed in such a manner that the line feed width is the same as the print width of the serial head.

5,813,777

STRESS RELIEVING KEYS

Bill Bonnstauffer, 27 Eldridge Ave., Staten Island, N.Y. 10302

Filed May 9, 1997, Ser. No. 854,259
Int. Cl.[6] B41J *5/12*
U.S. Cl. 400—491 16 Claims



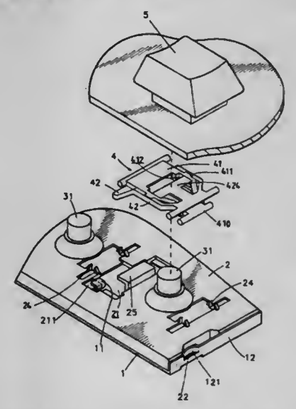
8. A one-piece key comprising a first top compartment, a second bottom compartment, and a divider separating said first and second compartments, wherein the divider comprises a deformable material, wherein the second compartment is hollow, and wherein the first compartment is imperforate and contains an enclosed gel composition.

5,813,778

KEY UNDERBOARD STRUCTURE OF COMPUTER KEYBOARD

Ma-Jung Shih, Taipei Hsien, Taiwan, assignor to Behavior Tech Computer Corp., Taiwan

Filed Mar. 28, 1997, Ser. No. 827,304
Int. Cl.[6] B41J *5/16*
U.S. Cl. 400—496 8 Claims



1. A key underboard structure adapted to be used in a computer key board assembly having a plurality of movable keys, the key underboard comprising:

a lower board adapted to support thereon an electric circuit board having a plurality of contacts corresponding to the keys, the lower board having a plurality of hooks provided thereon;

a rubber pad having a plurality of raised caps integrally formed thereon, each cap being adapted to receive and hold therein a contact pad, and each cap having a resiliency so as to be depressible to elastically deform and to resume an original configuration after the depression is released, the rubber pad being placeable on an electric circuit board on the lower board, the rubber pad having a plurality of first openings therein corresponding in location to the hooks of the lower

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board and each first opening sized to allow the respective hook in each first opening to move relative to the rubber pad in a direction on parallel with the rubber pad;

an upper board being placed above the rubber pad, the upper board having a plurality of second openings corresponding in location to the hooks of the lower board to receive the hooks to extend through the second openings, a respective support deck on the upper board provided in each second opening, the second openings being sized to allow the hooks to move relative to the upper board in a direction parallel with the upper board to be received over and supported on the respective support deck provided in each second opening for defining a bayonet engagement between the upper and lower boards for securely sandwiching the rubber pad and the electric circuit board between the upper board and the lower board, the upper board further comprising a plurality of through holes corresponding in location to and receiving the raised caps therein;

driving means disposed between each of the raised caps and the respective key, the driving means comprising a first member and a second member, both having a substantially flat portion, the first member having a first end pivoted to the upper board and having a second end, the second member having a third opening therethrough, and also having a third end which is movably and rotatably mounted on the upper board, the first end of the first member and the third end of the second member being so placed and spaced apart on the upper board that the first and second members have a collapsed overlapped condition wherein the second member is then above the first member and the second end of the first member extends through the third opening in the second member, and the first member being pivotally connected to the second member in the third opening for allowing the first member and the second member to be rotatable with respect to each other, about the pivotal connection between the first and second members, between an expanded, cross configuration condition resting on and supported by the raised cap beneath the first member and a collapsed, overlapped configuration condition depressing the key so that when the key is depressed, the driving means changes from the expanded condition to the collapsed condition to deform the cap from the original configuration to a depressed configuration to bring the contact pad disposed therein into contact with the associated contact of the circuit board.

5,813,779

PRINTING APPARATUS HAVING USER KEYS

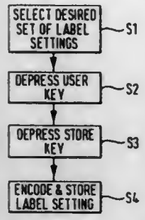
Mathew Richard Palmer, Cottenham; Robert Charles Lewis Day, Fulbourn, and Jonathan Peter Tremlett, Tooting, all of United Kingdom, assignors to Esselte N.V., Sint Niklaas, Belgium

Filed Aug. 6, 1996, Ser. No. 692,663

Claims priority, application United Kingdom, Aug. 25, 1995, 9517440

Int. Cl.[6] B41J *5/08;* **G06F** *3/02*

U.S. Cl. 400—615.2 **15 Claims**



1. A label printing device for printing an image on an image receiving medium comprising:

a printing mechanism;

a keyboard having a user key and a plurality of data entry keys for entering data for controlling the printing mechanism, said data entry keys providing a plurality of different label settings

storage means for holding data accessible in response to said data entered at the keyboard;

a controller, operatively connected to the print mechanism to define an image to be printed on said image receiving medium using the stored data said controller operating selectively in one of a plurality of modes of operation to define the image, said modes including:

a normal mode of operation in which at least some of the keys have predetermined functions associated therewith to access predetermined data associated with the predetermined functions;

a user determination mode entered by activation of the user key in which the user uses said keyboard to define a user function associated with one or more of said data entry keys so that user defined data is held in the storage means to implement said user function, said user defined data defining a set of label settings selected by the user in said user determination mode, said set of label settings comprising a subset of the plurality of label settings available via said data entry keys; and

a user defined mode in which said data entry keys define a label to be printed in accordance with the user defined data.

5,813,780

AUTOMATIC SHEET FEEDING APPARATUS

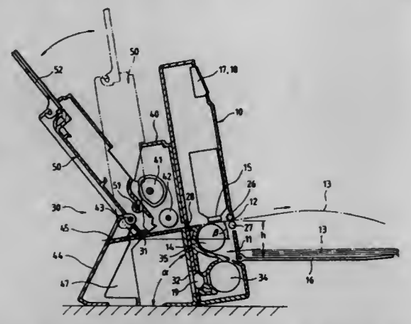
Takehiko Kiyohara, Zama, and Tetsuhiro Nitta, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 951,327, Sep. 25, 1992, abandoned, which is a continuation of Ser. No. 581,885, Sep. 13, 1990, abandoned. This application Dec. 12, 1994, Ser. No. 356,778

Claims priority, application Japan, Sep. 18, 1989, 1-241374; Sep. 18, 1989, 1-241375; Sep. 18, 1989, 1-241376; Sep. 18, 1989, 1-241377

Int. Cl.[6] B41J *11/58*

U.S. Cl. 400—629 **35 Claims**



28. A recording apparatus provided with an automatic sheet feeding apparatus, said recording apparatus comprising:

a recording means;

a sheet storing means for storing recording sheets;

a sheet feeding means for feeding the recording sheets from said sheet storing means to said recording means; and

attachment means for attaching said sheet storing means to said sheet feeding apparatus and for movably supporting said sheet storing means between at least a substantially vertical position wherein the sheet storing means is in close proximity to said sheet feeding apparatus and an inlet space capable of storing the sheets in said sheet storing means is formed and an inclined position wherein the sheet storing means is separated from said sheet feeding apparatus,

wherein, when said sheet storing means is in the inclined position, the recording sheets in said sheet storing means are in sufficiently close proximity to said sheet feeding means to enable the recording sheets to be separated and fed to said recording means by said sheet feeding means.

5,813,781

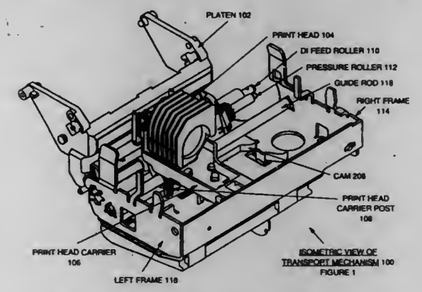
DOCUMENT FEED ROLLER OPENER AND METHOD THEREFOR

Richard Hunter Harris; Jeff David Thomas, and Kevin Hunter Vorhees, all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1997, Ser. No. 781,770

Int. Cl.[6] B41J *13/02*

U.S. Cl. 400—636 **22 Claims**



1. A document feed roller, comprising:

a print head carrier having a print head carrier post;

a document insert lever having a first end and a second end, the document insert lever having a cam at the second end, wherein the print head carrier post engages the cam to rotate the document insert lever in a first direction;

a device having a first end coupled to the first end of the document insert lever and a second end;

a document insert feed roller having a first end and a second end, the first end and the second end of the document insert feed roller being in a first fixed position;

a pressure roller having a first end and a second end, the first end of the pressure roller being in a second fixed position and the second end of the pressure roller being coupled to the second end of the device, the second end of the pressure roller being moved away the second end of the document insert feed roller when the print head carrier post engages the cam to rotate the document insert lever in the first direction.

5,813,782

APPARATUS FOR MOVING A PAPER SHEET

Thomas S. Mason, Canton, Ohio, assignor to Interbold, North Canton, Ohio

Division of Ser. No. 213,411, Mar. 15, 1994. This application Jul. 21, 1997, Ser. No. 897,809

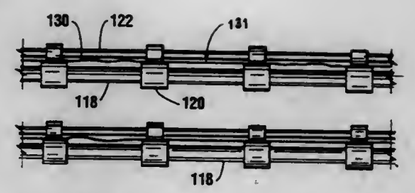
Int. Cl.[6] B41J *13/076*

U.S. Cl. 400—636 **27 Claims**

24. A method comprising the steps of:

placing a supply of paper in an automated banking machine;

extending a sheet of paper from the supply into engagement with a plurality of laterally disposed pairs of generally opposed rolls, wherein at least one of the rolls in each pair includes a circumferential discontinuity, wherein the sheet is engaged between the opposed rolls in a pair and is enabled to move in the lateral direction between the rolls in the pair when the circumferential discontinuity on a first roll in the pair moves adjacent to the opposed roll in the pair; and



rotating said rolls in said roll pairs with a drive, said sheet moving in engaged relation between said rolls in said pairs in a first direction generally normal to said lateral direction and moving in the lateral direction where the circumferential discontinuities move adjacent to the sheet.

5,813,783

CONVEYING DEVICE FOR A RECORDING PAPER

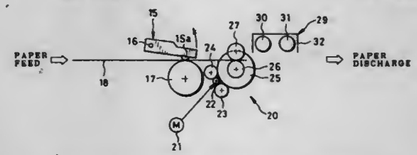
Naoki Takatori, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1997, Ser. No. 881,351

Claims priority, application Japan, Jun. 24, 1996, 8-163319; Jun. 24, 1996, 8-163320

Int. Cl.[6] B41J *13/03*

U.S. Cl. 400—636.2 **16 Claims**



1. A conveying device for a recording paper, comprising:

a motor;

a driven gear;

a driving gear for transmitting drive force of said motor to said driven gear;

a capstan roller coaxially provided with said driven gear and integrally rotated therewith;

a rotatable pinch roller pressing said capstan roller,

said recording paper being nipped by said capstan roller and said pinch roller and conveyed in accordance with a rotation of said capstan roller; and

a plurality of intermediate gears for meshing with both of said driving gear and said driven gear, said intermediate gears transmitting a same direction of rotation of said driving gear to said driven gear.

5,813,784

SOLID DEODORANT SAMPLER PACKAGE

Leonora M. Durliat, Toledo, Ohio, assignor to Owens-Illinois Closure INc., Toledo, Ohio

Filed Oct. 3, 1996, Ser. No. 723,648

Int. Cl.[6] A45D *40/00;40/16*

U.S. Cl. 401—98 **33 Claims**

1. A solid deodorant sampler package that comprises:

a plastic body having a peripheral wall with an open upper end surrounded by an upper edge, and an upwardly and outwardly curved base wall within said peripheral wall in the form of an open grid integrally joined to said peripheral wall at a position spaced from said upper edge such that a portion of said peripheral wall extends between said base wall and said upper edge,

a plastic cover including a base wall and a peripheral skirt telescoped over said upper edge and said portion of said peripheral wall, and

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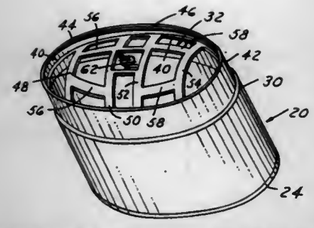
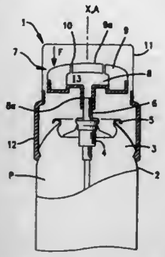


a solid deodorant non-movably filling the space between said base wall of said body and said base wall of said cover, said solid deodorant being formed in situ in said body such that said base wall of said body is embedded in said deodorant and a peripheral portion of said deodorant is surrounded by said portion of said peripheral wall between said base wall and said upper edge of said body.

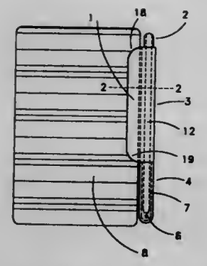
5,813,785
DEVICE FOR THE PACKAGING, DISPENSING AND APPLICATION OF A GEL OR FOAM
Gilles Baudin, Domont, and Nicolas Albisetti, Sevran, both of France, assignors to L'Oreal, Paris, France
Filed Jan. 28, 1997, Ser. No. 790,367
Claims priority, application France, Jan. 29, 1996, 96 01003
Int. Cl.[6] A45D *34/00;34/04*
U.S. Cl. 401—190 **21 Claims**



1. A device for packaging, dispensing and applying a product that is packaged in liquid form and dispensed as one of a foam and a gel, the device comprising:
a pressurized container (**2**) containing the product in liquid form;
an actuating valve (**4**) for passing the product from the container;
an applicator element (**9**) for applying the product as one of a foam and a gel, said applicator element (**9**) having an external application surface (**9***a*) made of a porous non-deformable material and at least one duct (**10**) traversing said applicator element (**9**) to an opening (**10***a*) in said external application surface (**9***a*) to allow the product to emerge through said opening (**10***a*) onto said application surface (**9***a*) as one of the foam and the gel in response to an actuation of said actuating valve (**4**).

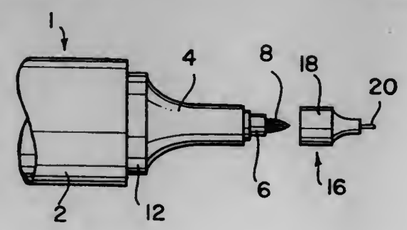
5,813,786
WRITING INSTRUMENT
Amir Fraenkel, Uziel St. 28/9, Jerusalem 96424, Israel
Filed Feb. 28, 1996, Ser. No. 613,769
Claims priority, application Israel, Mar. 1, 1995, 112838
Int. Cl.[6] B43K *29/00;23/02*
U.S. Cl. 401—195 **3 Claims**

1. A writing instrument having means for detachably securing a card thereto comprising:



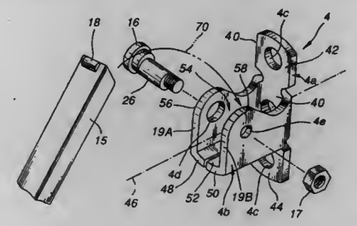
an essentially cylindrical casing having a cavity or bore longitudinally disposed therein;
an essentially cylindrical writing element housed within said cavity or bore;
a pair of essentially planar extensions integrally formed with said essentially cylindrical casing and being resiliently opposed toward each other to define a groove therebetween, said pair of essentially planar extensions having a matingly wavy contour undulating along a longitudinal axis;
at least one ridge directed along a longitudinal axis of at least one of said essentially planar extensions and directed into said groove, whereby a card inserted into said groove or cavity is intermittently engaged by said ridge to secure the card within said groove.

5,813,787
NIB UNITS FOR PENS
Martin Edward Dowzall, Franklin Lakes, and Vazgen John Houssian, Union City, both of N.J., assignors to Esselte UK Limited, Ashford, England
PCT No. PCT/GB93/00510, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO93/17879, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 11, 1993, Ser. No. 295,829
Claims priority, application United Kingdom, Mar. 11, 1992, 9205398
Int. Cl.[6] B43K *8/02;8/12*
U.S. Cl. 401—199 **12 Claims**



1. A nib conversion unit for converting a marker implement having a fixed main nib of one size into an implement with an effective auxiliary nib of smaller size, the unit comprising a housing adapted to engage detachably the end of the implement adjacent to the main nib, the housing carrying a thin auxiliary nib adapted, when the housing is so engaged, to enter into liquid communication with the main nib and to project from the housing to operate as capillary-fed nib, the main nib being subject to wear such that a gap may be created between the main nib and the thin auxiliary nib, thereby preventing liquid communication between the main and auxiliary nibs,
said auxiliary nib being movable axially of the housing, whereby it may be moved into ink-transfer contact with the main nib by force applied to the tip of the auxiliary nib, thereby closing any gap which may be created between the main and auxiliary nibs due to wear of the main nib.

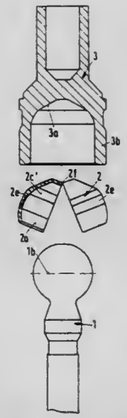
5,813,788
COUPLING AND METHOD OF MANUFACTURING SAME
Yoshimi Yamamoto, Mikkabi, Japan, and Gunnar Eriksson, Nygatan, Sweden, assignors to Fuji Kiko Co., Ltd., Tokyo, Japan
Filed Sep. 6, 1996, Ser. No. 708,231
Claims priority, application Japan, Sep. 8, 1995, 7-230602
Int. Cl.[6] F16D *3/00*
U.S. Cl. 403—57 **11 Claims**



1. A coupling, for coupling a torque transmitting device to a receiving device, comprising:
a first linking section adapted to be secured to the torque transmitting device, said first linking section including a hub portion and two leg portions connected and integrated to said hub portion, said hub portion and two leg portions being arranged in a plane perpendicular to an axis of rotation of the coupling;
a second linking section including a first wing and a second wing opposed in a spaced relation to each other, said first and second wings defining a longitudinal slot allowing the passage of the receiving device, said longitudinal slot being substantially parallel to the axis of rotation of the coupling, and
an arrangement securing the receiving device, said securing arrangement including protrusions located on both sides of said longitudinal slot and respectively integrated with said first and second wings, a first of said protrusions and said first wing being arranged in a first plane and a second one of said protrusions and said second wing being arranged in a second plane substantially parallel to said first plane, said protrusions being formed with coaxial holes in order to form an assembly axis of a fastening unit including a tightening bolt and a nut;
said first and second linking sections being connected to each other and being formed from a single sheet of metal.

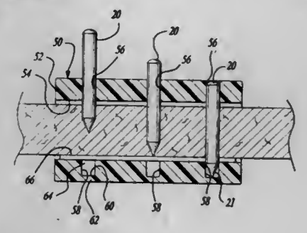
5,813,789
BALL-AND-SOCKET JOINT
Wolfgang Prickler, Kaarst; Matthias Kaussen, Essen, and Christian Wutzler, Kaarst, all of Germany, assignors to TRW Fahrwerksysteme GmbH & Co. KG, Dusseldorf, Germany
Filed Nov. 26, 1996, Ser. No. 756,343
Claims priority, application Germany, Dec. 7, 1995, 195 45 567.3
Int. Cl.[6] F16C *11/06*
U.S. Cl. 403—135 **5 Claims**

1. A ball and socket joint comprising:
a ball stud having a stud portion centered on a ball stud axis and a coupling ball at one end of said stud portion, said coupling ball having a center on said ball stud axis and an equator extending around said coupling ball at said center of said coupling ball and extending around said ball stud axis, said



equator lying in a plane which is perpendicular to said ball stud axis and which contains said center of said coupling ball;
a joint housing having a chamber in which said coupling ball is located; and
a plastic bearing shell in said chamber in said joint housing for supporting said ball stud for pivotal movement relative to said joint housing,
said joint housing including an end portion defining an opening into said joint housing through which said stud portion of said ball stud extends, said end portion of said joint housing having a crimpable portion which is crimped into contact with said plastic bearing shell,
said plastic bearing shell having a first portion located on one side of said equator of said coupling ball and engaging said coupling ball on one side of said equator, said plastic bearing shell having a second portion located on the other side of said equator for engaging said coupling ball on said other side of said equator,
said first portion of said plastic bearing shell comprising at least two sections which are hinged to one other for pivotal movement about a transverse axis extending transverse to said ball stud axis, and
said second portion of said plastic bearing shell comprising at least two sections which are pivotally movable about said transverse axis and which move toward one another into engagement with said coupling ball when said crimpable portion of said joint housing is crimped.

5,813,790
ROPE FASTENER
Leo Goran, Jr., 2714 Deborah Dr., Punta Gorda, Fla. 33950
Filed Sep. 19, 1996, Ser. No. 715,584
Int. Cl.[6] F16B *7/00*
U.S. Cl. 403—283 **4 Claims**



1. A rope fastener comprising:

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a body of a resilient material having a longitudinal rope passage extending therein having at least one open end and being of a size to receive a rope therein;

at least one nail bore extending through said body in a direction transverse to said rope passage and aligned to cross said rope passage, said nail bore having an initial nail receiving portion on one side of said rope passage and secondary nail receiving portion on the opposite side of the rope passage, said initial nail receiving portion having an open end on the exterior surface of said body for reception of a nail;

means retained by said body adjacent said rope passage for closing said secondary nail receiving portion adjacent said rope passage, said means for closing being penetrable by nails inserted into said initial nail receiving portion of said nail bore and across said rope passage to secure the rope within said rope passage to said body; and

said nail for insertion into said at least one nail bore through said initial nail receiving portion and the rope and into said secondary nail receiving portion to retain the rope in said rope passage, said nail being tightly fitting in said nail bore whereby said nail is retained in said body.

5,813,791

CHASSIS COUPLING AND FIXING STRUCTURE

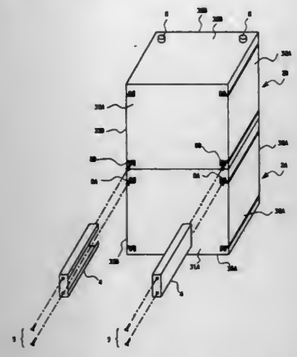
Yasuhiro Kubota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 447,029, May 22, 1995, Pat. No. 5,666,713. This application Oct. 11, 1996, Ser. No. 728,911

Claims priority, application Japan, May 26, 1994, 6-112496

Int. Cl.[6] F16B *3/00*

U.S. Cl. 403—294 **3 Claims**



1. A chassis coupling and fixing structure incorporated in a chassis, for assembling together a first chassis and a second chassis, comprising:

coupling members each of which includes:

a plate portion extending in a longitudinal direction;

an upper coupling flange portion extending from a top edge of said plate portion along the longitudinal direction in an inner direction of said second chassis and having a first L-shaped portion extending downward;

a lower coupling flange portion extending from a bottom edge of said plate portion along the longitudinal direction in an inner direction of said first chassis and having a second L-shaped portion extending upward;

a fixing flange having holes and extending perpendicular to said plate portion; and

screws for screwing said fixing flange to said first and second chassis through the holes; and

coupling grooves provided at lower and upper portions of said first and second chassis to form groove pairs into which said coupling members are inserted.

5,813,792

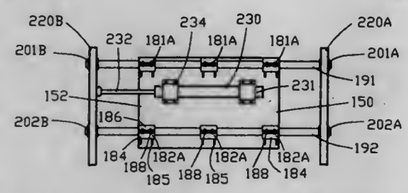
COUPLING DEVICE

John W. Edwards, P.O. Box 2350, Arcadia, Fla. 34265

Filed Nov. 13, 1996, Ser. No. 748,565

Int. Cl.[6] F16B *2/02*

U.S. Cl. 403—322 **18 Claims**



1. An improved lateral coupling device for coupling a tool to a vehicle, the vehicle having a first arm extending from the vehicle for carrying the tool, and a second arm extending from the vehicle for orienting the position of the tool relative to the first arm, the improved lateral coupling device comprising:

a coupling member having a first and a second pivot for pivotably securing said coupling member to the first and second arms;

a first and a second bearing secured to said coupling member;

a first and a second shaft slidably mounted in said first and second bearings;

a pair of connector members secured in proximity to opposed ends of said first and second shafts for mounting to the tool; and

an actuator coacting between said coupling member and said connector member for moving said connector member relative to said coupling member on said first and second shafts for laterally adjusting the position of the tool relative to the vehicle.

5,813,793

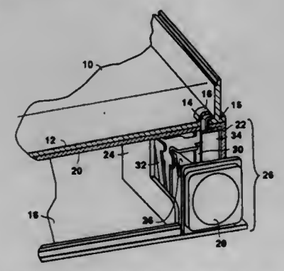
SELF-LOCATING DUAL MOTION LOCKING APPARATUS FOR JOINING COMPUTER HOUSINGS

Allan Scott Baucom, Townsend, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 492,464, Jun. 19, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 782,861

Int. Cl.[6] H05K *5/02;* **F16B** *1/04*

U.S. Cl. 403—325 **4 Claims**



1. Two housings capable of being attached and unattached comprising:

a first housing having a wall with a generally planar exterior surface and a locking opening at the exterior surface, the locking opening defining an engagement locking edge at its boundary;

a second housing having a wall with a generally planar exterior surface and a plunger opening there through, the wall of the second housing further having a mounting region at the interior surface thereof associated with the plunger opening, the locking opening of the first housing and plunger opening of the second housing being aligned at attachment of the housing; and

a locking mechanism mounted in the mounting region of the second housing, such mechanism including:

a plunger mounted for movement up to an extended position and down to a retracted position in the plunger opening, the extended position being the unattached position and the retracted position being the attachment position;

a biasing device urging the plunger toward the extended position;

a catch spring including a lock catch section and a plunger release and hold down section, the lock catch section having an arm extending in the direction of the up and down movement of the plunger and an engagement lip on an end region of the arm extending laterally of the arm, the catch spring being mounted so that the arm extends through the plunger opening to place the engagement lip in spaced apart relationship with the external surface of the second housing, the plunger release and hold down section extending in a direction transverse to the movement of the plunger, the catch spring further including a biasing section urging the arm to place the engagement lip into interlocking engagement with the locking edge, the plunger further having a stepped member providing a hold down surface and a hold off surface, the hold off surface extending generally normal to the hold down surface, the plunger release and hold down section of the catch spring engaging the hold down surface of the stepped member of the plunger when the plunger is in the retracted position, the arm moving under the influence of the biasing section to place the engagement lip into interlocking engagement position with the locking edge of the locking opening of the first housing and allowing the plunger release and hold down section of the lock catch to move into engagement with the hold down surface of the plunger when the plunger is moved downwardly to the retracted position, the hold off surface of the stepped member to hold the arm so that the engagement lip is out of interlocking relationship with the engagement; and

a release button having a ramp, such release button being mounted on the second housing for forward and rearward movement in a direction transverse to the up and down direction of the plunger and along a path bringing the ramp into contact with the biasing section of the catch spring when the release button is moved forward, such forward movement of the release button causing the ramp to move the catch spring to disengage the engagement lip from the engagement locking edge of the first housing and to disengage the plunger release and hold down section of the catch spring from the hold down surface of the plunger, the plunger being allowed to move under the influence of the biasing device to the extended position.

5,813,794

TELESCOPIC SHAFTS

Melchor Daumal Castellon, Diputacion, 455, Barcelona, Spain, 08013

Filed Apr. 18, 1997, Ser. No. 839,792

Claims priority, application Spain, Apr. 18, 1996, 9600871

Int. Cl.[6] B62D *1/18*

U.S. Cl. 403—359 **4 Claims**

1. A telescopic shaft comprising:

a female tubular member having an end region with a fork and an opposite end having an orifice receiving an end region of a male tubular member with an opposite end of the male tubular member having a fork,

peripheral regions of the female tubular member and the male tubular member having channels and ribs for sliding of the male tubular member with respect to the female tubular member and vice versa,

a projection provided in the opposite end of the female tubular member, said projection sliding, in the event of collapse of the male tubular member and the female tubular member, through a region of the end region of the male tubular member, the peripheral region of the male tubular member including a throat which longitudinally interrupts the channels and ribs of the male tubular member, wherein the throat is formed by a peripheral sliding region of radius r_1 and a further sliding region of radius r_2 with the radius r_1 being greater than the radius r_2 and the projection initially sliding in the further sliding region of radius r_2 and upon continued application of force sliding in the peripheral sliding region of radius r_1 having increased resistance to the applied force.

5,813,795

FINISHING ARRANGEMENT FOR A FRONT PERIPHERAL FLANGE OF A CABINET

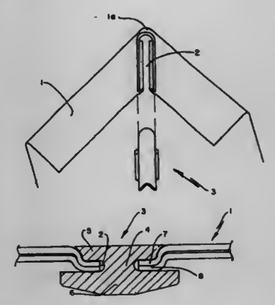
Estevão Marino Espíndola; Orestes Do Amaral, and Rogério Pereira, all of Joinville-SC, Brazil, assignors to Multibrás S/A Eletrodomésticos, São Paulo - SP, Brazil

Filed Dec. 5, 1996, Ser. No. 760,699

Claims priority, application Brazil, Dec. 5, 1995, 9505359-0

Int. Cl.[6] F16B *2/20*

U.S. Cl. 403—402 **12 Claims**



1. A finishing arrangement comprising:

panel having two flange pieces which are substantially orthogonal to each other with opposing edges with a space therebetween, said two flange pieces each having a main section generally co-planar with the main section of the other piece and a marginal portion depressed from said main section at the end thereof containing one of said opposing edges, said depressed marginal portions of said two flange pieces being generally co-planar with each other; and

a finishing element having a top part and a bottom part joined by a reduced width midsection, said element midsection fitting in said space between said opposing edges of said flange pieces, said top part of said element fitting in said depressed marginal portions over one surface of each of said two flange pieces and substantially covering said one surface of said marginal portions of said flange pieces, and the bottom part of said element overlying the other surface of the marginal portions of each of said flange pieces.

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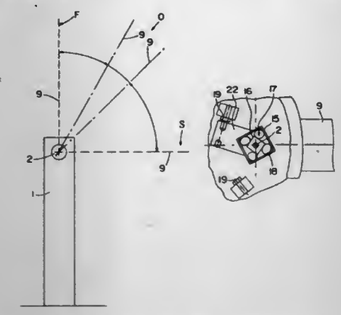
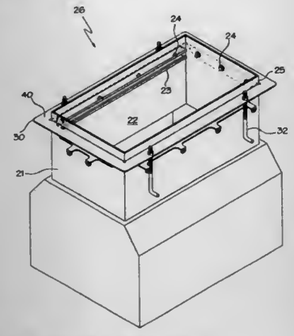
5,813,796
ROADWAY BARRIER
Wolfram Kocznar, Innsbruck, Austria, assignor to Skidata Computer Gesellschaft mbH, Gartenau, Austria
PCT No. PCT/AT96/00052, § 371 Date Feb. 25, 1997, § 102(e) Date Feb. 25, 1997, PCT Pub. No. WO96/29472, PCT Pub. Date Sep. 26, 1996
PCT Filed Mar. 19, 1996, Ser. No. 737,664
Claims priority, application Austria, Mar. 20, 1995, 486/95
Int. Cl.[6] E01F *13/00;9/00;* **B61L** *5/16*
U.S. Cl. 404—6 **26 Claims**



1. A barrier for a roadway, said barrier comprising:
an upright arranged beside said roadway,
a swiveling drive having a drive motor and a horizontal drive spindle mounted in said upright, said drive spindle having a free end,
a barrier arm carried by said free end of said drive spindle, said barrier arm being swivelable between a horizontal locked position and an upward-facing free position, and
a balancing spring supporting the opening of said barrier arm, said balancing spring being coaxial to said drive spindle and having an untensioned zero position between said locked position and said free position of said barrier arm.

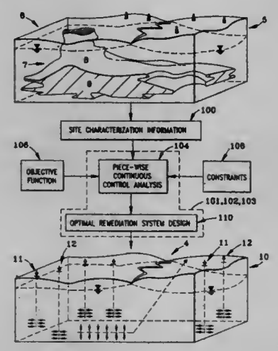
5,813,797
UNITARY SUMP FRAME
David Pendleton, Fairfield, Ohio, and John Joseph Matracia, Edgewood, Ky., assignors to Dover Corp., New York, N.Y.
Continuation of Ser. No. 728,255, Oct. 8, 1996. This application Jan. 10, 1997, Ser. No. 781,337
Int. Cl.[6] E02D *29/14;* **E02B** *13/00;* **B65B** *1/04*
U.S. Cl. 405—52 **17 Claims**



1. An unitary sump frame, comprising:

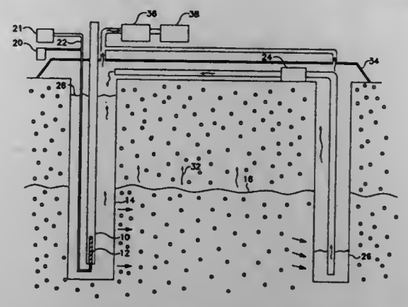
a) a substantially planar and continuous flange for circumscribing the mouth of an underground sump, said flange having an outer perimeter and an inner perimeter, the inner perimeter defining a polygon-shaped opening;
b) a plurality of discrete lips, the number of which corresponds to the number of sides in the polygon-shaped opening, each lip being integrally connected to the flange and extending downwardly from the inner perimeter of the flange, at least one of said plurality of lips including a hole for receiving a fastener; and
c) a lug integrally connected to each lip and extending away from the opening, said lugs being operative for anchoring the frame in the ground;
said flange, plurality of lips, and lugs being formed from a single sheet of material.

5,813,798
PIECEWISE CONTINUOUS CONTROL OF GROUNDWATER REMEDIATION
Greg Whiffen, 4 Albany Ave., Round Lake, N.Y. 12151-0516
Filed Mar. 28, 1997, Ser. No. 829,915
Int. Cl.[6] E02B *13/00;* **B01D** *1/00;* **G06G** *7/57*
U.S. Cl. 405—52 **26 Claims**



1. A method for remediating a contaminated groundwater site comprising the steps:
(a) determining contaminated groundwater site characterization information;
(b) generating a model of said contaminated groundwater site from said characterization information;
(c) designing a remediation system for said model by:
(c1) defining at least one management period; and
(c2) utilizing a control capable of continuously changing and allowing for discontinuity within each management period; and
(d) implementing said remediation system to remediate said contaminated groundwater site.

5,813,799
COMBUSTION PROCESS AND APPARATUS FOR REMOVING VOLATILE CONTAMINANTS FROM GROUNDWATER OR SUBSURFACE SOIL
Hartwell F. Calcote, Princeton, and Charles H. Berman, East Windsor, both of N.J., assignors to Aerochem Research Laboratories, Inc., Princeton, N.J.
Filed Jul. 22, 1996, Ser. No. 681,007
Int. Cl.[6] B09C *1/06;* **C02F** *1/02;* **E21B** *36/02*
U.S. Cl. 405—128 **14 Claims**

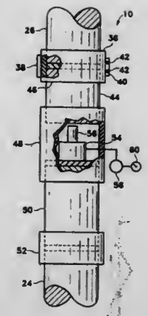


1. A method for removing a volatile organic contaminant from ground water or subsurface soil surrounding a well which, which comprises;
positioning a casing in said well;
positioning a burner tube assembly in water in said well;
positioning a packer over said casing;
positioning a pressure release valve with an inlet port below said packer;
positioning a vapor barrier about a region surrounding said well;
introducing a combustible gas mixture into said burning tube to heat said water by indirect heat exchange in said well to a temperature for a time sufficient to form an expanding thermal boundary thereby forcing said volatile organic contaminants from said well through said subsurface soil;
collecting a gaseous stream from said vapor barrier including said volatile organic contaminant; and
removing said volatile organic contaminant from said gaseous stream.

12. An assembly for removing a volatile organic contaminant from groundwater, which comprises:
a burner tube assembly;
conduit means for positioning said burner tube assembly in a well in said aquifer to be treated;
means for introducing a combustible gaseous mixture into said burner tube assembly to vaporize said volatile organic contaminant;
a vapor barrier peripherally-disposed on a ground surface about said well for collecting a gaseous mixture including said volatilized contaminant; and
means for separating said contaminant from said gaseous mixture.

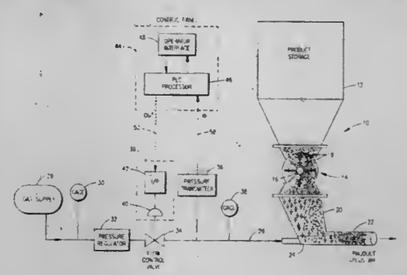
5,813,800
PROCESS FOR REPLACING AND LOADING A DAMAGED SECTION OF A PILE
Donald L. Doleshal, 31460 W. 135Th St., Olathe, Kans. 66061
Filed Mar. 4, 1996, Ser. No. 610,305
Int. Cl.[6] E02D *5/64;7/00;11/00*
U.S. Cl. 405—232 **16 Claims**

1. A process for replacing a damaged section of a pile supporting a load comprising the steps of:
a. removing a damaged section of an existing pile, thereby creating at least a lower end of said existing pile and an upper load bearing structure;



b. installing a replacement pile section between said lower end of said existing pile and said upper load bearing structure;
c. installing at least one hydraulic jack inside a hollow portion of said replacement pile section for exerting tension forces along a line parallel with said pile between said lower end of said existing pile and said load bearing structure; and
d. exerting a tension force along said parallel line.

5,813,801
DENSE PHASE PARTICULATE CONVEYING SYSTEM AND METHOD WITH CONTINUOUS AIR LEAKAGE MANAGEMENT
Richard E. Newbolt, Sabetha, Kans., and Ross McEllhiney, Parkville, Mo., assignors to Mac Equipment, Inc., Sabetha, Kans.
Filed Jun. 28, 1996, Ser. No. 673,357
Int. Cl.[6] B65G *53/66*
U.S. Cl. 406—14 **17 Claims**



15. A method for conveying particulate material in dense phase through a conveying pipe, said method comprising:
selecting a volume V_C of gas for conveying the particulate material in said material conveying pipe;
obtaining an indication of a volume V_L of gas that is lost as a result of leakage; and
supplying a volume V_R of gas to said material conveying pipe, wherein $V_R=V_C+V_L$.

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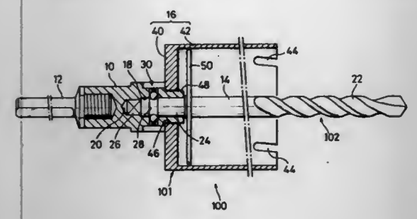
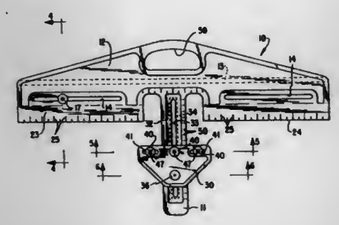
5,813,802
DRILLING TOOL ASSEMBLY AND ITS CENTER DRILL AND CUP SHAPE DRILL
Kunio Ajimi, and Tsuneyoshi Ajimi, both of Higashiosaka, Japan, assignors to House B.M. Co., Ltd., Higashiosaka, Japan
Filed Nov. 27, 1996, Ser. No. 757,815
Claims priority, application Japan, Nov. 30, 1995, 7-312409; Apr. 9, 1996, 8-086823; May 9, 1996, 8-114814
Int. Cl.[6] B23B *47/00*
U.S. Cl. 408—68 17 Claims



1. A cup shape drilling tool assembly comprising:
a cup shape drill member including tip on a leading end thereof;
a center drill partially enclosed in the cup shape drill member in a side view thereof, including;
a drill portion formed on a leading end of the center drill,
a dust extractor radially outwardly extending from a portion of the center drill lying in the sup shape drill member
a tool chucking device for securely holding the center drill at a middle of the cup shape drill member in a plan view.

5,813,803
TEMPLATE FOR LOCATING DRAWER PULLS
Marc S. Sommerfeld, 40328 220th St., Le Mars, Iowa 51031
Filed Mar. 26, 1997, Ser. No. 824,815
Int. Cl.[6] B23B *47/28*
U.S. Cl. 408—115 R 9 Claims

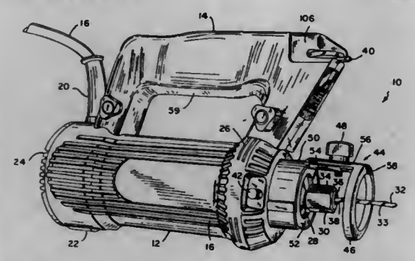


1. A template for locating pull devices on a drawer or cabinet front having a top edge, a bottom edge and two sides connecting said edges, said template comprising a T-shaped member having a cross member and a leg extending from the cross member, said cross member extending approximately equal distance on both sides of said leg, said cross member being formed with a rib to provide a top guide engageable with said top edge, edge guide means slidably mounted on said cross member and adapted to engage said sides, indicia on said cross member for positioning said edge guide means a specific distance from said leg, slide means slidably and adjustably mounted on said leg whereby the distance from said rib to said slid means can be adjusted, and drill guide means on said slide means adapted to guide a drill to drill holes in said front.

5,813,804
BORING TOOL FOR COMPOSITE LAMINATE MATERIALS
Bert P. Erdel, Belle Mead, N.J., assignor to Mapal, Piscataway, N.J.
Filed Oct. 30, 1995, Ser. No. 550,015
Int. Cl.[6] B23B *51/02*
U.S. Cl. 408—145 7 Claims

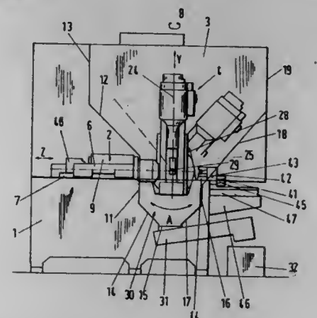
1. A boring tool for producing holes in a composite of at least a first material and a second material having a higher modulus of elasticity than the first material when the tool, relative to the composite, is rotated about its longitudinal axis in a first direction of rotation and is moved in a forward axial direction against the composite, the tool comprising:
an elongated body portion having a distal cutting region and a proximal shank region;
first and second cutting regions including first and second planar surfaces, respectively, said planar surfaces diverging in a direction from the distal cutting region toward the proximal shank region to define a cutting angle of between 110° to 125°;
a first axial flute separating a forward edge of said first cutting region from a trailing edge of said second cutting region; and
a second axial flute radially opposed to said first axial flute and separating a forward edge of said second cutting region from a trailing edge of said first cutting region;
wherein each of said first and second cutting regions further includes a planar surface forming with a forward edge thereof respective first and second clearance angles of between 10° to 20°, said first clearance angle being greater than said second clearance angle.

5,813,805
SPIRAL CUTTING TOOL WITH DETACHABLE HANDLE
Robert K. Kopras, 4524 Bluemounds Trail, Black Earth, Wis. 53515
Filed Aug. 29, 1996, Ser. No. 705,254
Int. Cl.[6] B23B *39/00*
U.S. Cl. 408—241 R 23 Claims



1. An improved hand held power tool of the type including a power tool housing enclosing means for rotating a shaft extending from an end of the power tool housing along an axis thereof and means for attaching a bit to the shaft, and wherein the power tool is used to remove material from a workpiece by positioning the axis of the power tool housing perpendicular to a surface of the workpiece and moving the power tool housing in a direction perpendicular to the axis of the housing and parallel to the surface of the workpiece to cause the rotating bit to be moved through the workpiece in a direction perpendicular to an axis of the bit to remove material from the workpiece, the improvement comprising:
(a) a handle having first and second handle ends and a gripping surface; and
(b) means for attaching and detaching the handle by hand at each of the first and second handle ends to the power tool housing such that the handle gripping surface is substantially parallel to the axis of the power tool housing.

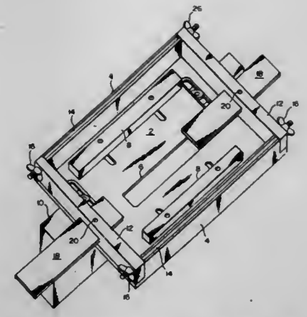
5,813,806
HOBBING MACHINE
Wolfgang Müller, Ludwigsburg, Germany, assignor to Hermann-Pfauter GmbH & Co., Ludwigsburg, Germany
Filed May 10, 1996, Ser. No. 644,230
Claims priority, application Germany, May 12, 1995, 295 07 871 U
Int. Cl.[6] B23F *21/00*
U.S. Cl. 409—11 24 Claims



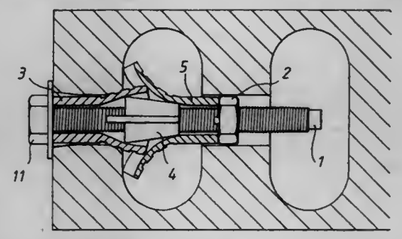
1. A hobbing machine comprising:
a tool assembly with a tool spindle;
a workpiece holding assembly with a workpiece spindle;
a first drive unit for driving said tool spindle;
a second drive unit for driving said workpiece spindle;
wherein at least one of said tool spindle and said workpiece spindle is a rotor of said first and said second drive unit, respectively,
a catch funnel positioned below a machining area of said tool assembly;
a machine bed thermally decoupled from said catch funnel:
said catch funnel having sidewalls spaced from said machine bed;
an insulation positioned between said sidewalls and said machine bed.

5,813,807
PLUNGE ROUTER GUIDE
Winston L. Rogers, 1690 Turnpointe Rd., Friday Harbor, Wash. 98250
Filed Feb. 11, 1997, Ser. No. 799,105
Int. Cl.[6] B23C *9/00*; B27C *5/10*
U.S. Cl. 409—178 3 Claims

1. A jig for use with a router, including a base and a bit, comprising:
a base plate to which a workpiece is clamped, said base plate including an elongated opening through which the router bit passes to operate upon the workpiece, said opening being of a greater dimension than the router bit to allow variability in the operation, said base plate including a pair of guides, parallel to said elongated opening, said guides being adjustable in a direction transverse to said opening, limiting the movement of the router in said direction; and
a rectangular gate element including a pair of end pieces connected by side members wherein the end pieces include adjustable stop members extending into the space within the rectangular gate, said gate and said base having complementary structure whereby said gate is removably attachable to the base plate to permit easy removal and reversal to create a mirror image of the router operation.



5,813,808
EXPANSION SCREW HAVING OVERLAPPING EXPANDING ELEMENTS
Ming-Hsin Wu, 14 Fl., No. 494, Sec. 2, Hsin-Chin Rd., Hsin Ying City, Tainan Hsien, Taiwan
Filed Oct. 28, 1996, Ser. No. 738,491
Int. Cl.[6] F16B *13/04*
U.S. Cl. 411—32 9 Claims



1. An expansion screw comprising:
a) a threaded shaft having a head on a first end thereof and a second end;
b) a retaining ring located on the threaded shaft and having a tapered wall tapering in one direction such that the retaining ring a large end and a small end, the retaining ring having two symmetric blocks extending from the large end and laterally from the small end;
c) a nut threadingly engaging the second end of the threaded shaft;
d) a first expanding member located on the threaded shaft on one side of the retaining ring and having a generally cylindrical configuration with a first axially slotted end portion facing toward the retaining ring;
e) a second expanding member located on the threaded shaft on a side of the retaining ring opposite from the first expanding member, the second expanding member having a generally cylindrical configuration with a second axially slotted end portion facing toward the retaining ring, and opposite end of

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the second expanding member engaging one of the nut and the head to prevent relative rotation therebetween;

whereby relative rotation between the threaded shaft and the nut moves the retaining ring into the first and second slotted ends of the first and second expanding members causing the slotted ends to expand radially outwardly from the threaded shaft such that the second slotted end overlaps the first slotted end.

5,813,809

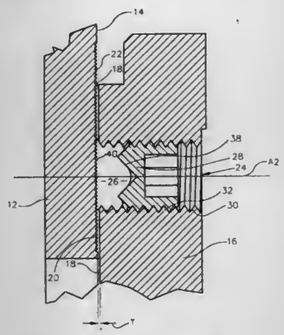
POLYMERIC INSERT WITH CRUSH-FORMED THREADS FOR MATING WITH THREADED SURFACE

William C. Russum, Tucson, Ariz., assignor to Wyko Corporation, Tucson, Ariz.

Filed Apr. 28, 1997, Ser. No. 847,823

Int. Cl.[6] F16B *37/16;* **B25G** *3/02*

U.S. Cl. 411—437 **12 Claims**



1. A method for producing a slidable threaded connection between two adjoining members comprising the following steps:

(a) providing a first member having a surface including first threads formed thereon;

(b) providing a second member having a non-threaded surface facing the threaded surface of said first member and having at least two openings bored therethrough substantially perpendicular to said non-threaded surface in the first member; and

(c) compressing a plastic insert in each of said openings against said first threads to form second threads slidably mating therewith;

wherein step (c) is carried out while ensuring that said second threads formed in the plastic insert are not crushed by a pressure exercised thereon and retain sufficient structural integrity to support said first threads in the first member.

5,813,810

FASTENER FOR CIRCULAR AND SQUARE APERTURES

Tomoharu Izume, Toyota, Japan, assignor to Nifco Inc., Yokohama, Japan

Continuation of Ser. No. 563,489, Nov. 28, 1995, abandoned. This application Jul. 3, 1997, Ser. No. 888,297

Claims priority, application Japan, Nov. 30, 1994, 6-319535

Int. Cl.[6] F16B *13/02;19/00*

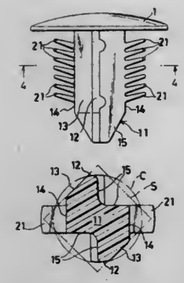
U.S. Cl. 411—510 **6 Claims**

1. A fastener made of a synthetic resin material, usable for both a circular engagement hole and a square engagement hole which are approximately the same in size, and comprising:

a head;

a leg depending from the head; and

two groups of vertically multilayered flexible fins formed on a periphery of the leg so as to extend radially outward, each said fin, when divided by a central line in the direction in



which the fins extend, having two segments symmetrical with each other relative to the central line, some of the fins being capable of staying in the engagement hole and being flexed by a wall of the engagement hole when the leg has been inserted into one of the engagement holes and others of the fins being capable of being thrust out of the engagement hole and restoring to their original states when the leg has been inserted into one of the engagement holes, thereby preventing the leg from being extracted from the engagement hole;

said leg, when in an undeformed state, having a lateral cross section capable of being circumscribed by both a circle of the circular engagement hole and a square of the square engagement hole and comprising a pair of opposed arcs for registering with the circle when the leg has been inserted into one of the engagement holes to hold the leg concentric with the circle and a pair of opposed parallel straight sides following the arcs and for registering with parts of opposed sides of the square when the leg has been inserted into one of the engagement holes to hold the leg concentric with the square;

each of the two groups of flexible fins forming an angle of 45° to the parallel straight sides as viewed in a section perpendicular to the length of the leg.

5,813,811

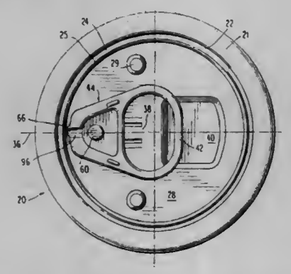
EASY-ACCESS SHEET METAL CONTAINER STRUCTURES

William T. Saunders, deceased, late of Weirton, W. Va., by Cleo M. Saunders, executrix, assignor to Weirton Steel Corporation, Weirton, W. Va.

Division of Ser. No. 99,195, Jul. 29, 1993. This application Nov. 22, 1996, Ser. No. 753,269

Int. Cl.[6] B21D *51/44*

U.S. Cl. 413—16 **8 Claims**



1. A sheet metal end closure, with an integral opener, for a beverage can body, comprising

A. an endwall panel of substantially planar contour, forming part of

B. unitary end closure structure for a beverage can body fabricated from predetermined nominal thickness gauge sheet metal, in which such end closure structure includes

(i) chime seam metal symmetrically spaced from the geometric center and disposed to peripherally circumscribe such entire endwall panel, with

such endwall panel being recessed symmetrically from such chime seam metal in an axial direction so as to be disposed, during use, toward the interior of such a beverage can body,

(ii) a chuck wall extending in such axial direction from such chime seam metal to a level axially interior of such endwall panel so as to define, with such unitary end closure structure sheet metal, a countersunk indentation recessed axially toward the interior of such a can body so as to provide buckle-resistance for such end closure structure peripherally circumscribing such entire endwall panel,

(iii) a bead projecting from such endwall panel, in an external direction in relation to such a can body, toward the geometric center of such endwall panel, located contiguous to such buckle-resistant profiling, and with

such bead, as projecting externally from such endwall panel, substantially eliminating flexing of endwall panel sheet metal contiguous to such externally projecting bead;

C. a scoreline, formed on such external surface of such endwall panel, having an elongated U-shaped configuration defining a tear strip for providing a pour-feature opening in such endwall panel,

such tear strip scoreline consisting essentially of endwall panel sheet metal of decreased thickness in relation to such nominal thickness gauge, with such scoreline being

symmetrically disposed in relation to a centrally-located elongated axis of such U-shaped configuration;

D. an elongated sheet metal opener for severing residual metal of such tear strip scoreline so as to enable sheet metal of such tear strip to be moved externally from such substantially planar endwall panel so as to provide a pour-feature opening while retaining such tear strip on such endwall panel; with

such elongated sheet metal opener being symmetrically disposed in relation to a centrally-located elongated axis for such opener and having a working end and a handle end, with each such end being located at a longitudinally opposite end of such axis;

E. unitary rivet means formed from endwall panel sheet metal, located within such tear strip scoreline, securing such elongated opener so as to be retained by such elongated U-shaped tear strip, with

such centrally-located elongated axis of such opener overlaying, prior to severing such residual metal of such tear strip, and extending in the same direction as, the centrally-located longitudinal axis of such U-shaped tear strip, so as to enable

such tear strip to be moved, by such opener, from such substantially planar contour of such endwall panel to provide a pour-opening; and, in which

such U-shaped tear strip scoreline includes

(iv) an arcuate shape defining a closed longitudinal end for such elongated U-shaped scoreline, and

(v) a pair of elongated scoreline legs, each extending from such arcuate shape, in laterally-spaced relationship, toward the remaining longitudinal end of such elongated tear strip scoreline which retains such tear strip, and such rivet-secured opener, externally on such endwall panel, with

such centrally-located longitudinal axis of the elongated tear strip intersecting such arcuate-shaped scoreline portion at its midpoint, and

such midpoint being positioned contiguous to such endwall projecting bead, which substantially eliminates flexing of sheet metal circumscribing such endwall panel so as to facilitate initiating puncturing rupture of such endwall panel residual scoreline sheet metal, and to provide for movement of sheet metal within such tear strip scoreline from such substantially-planar endwall panel so as to be retained, with such rivet-secured opener, externally on such closure structure at a location free of obstruction to such pour-feature opening.

5,813,812

APPARATUS FOR FORMING A SEAM

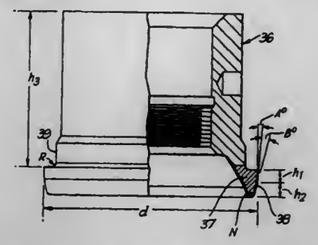
Peter Leslie Moran, Fairford, and Adrian Kempster, Ramsey, both of United Kingdom, assignors to Carnaudmetalbox (Holdings) USA, Inc., Wilmington, Del.

Continuation of Ser. No. 423,734, Apr. 18, 1995, abandoned. This application Aug. 6, 1997, Ser. No. 906,837

Claims priority, application United Kingdom, Apr. 20, 1994, 9407793

Int. Cl.[6] B21D *51/32*

U.S. Cl. 413—31 **14 Claims**



1. A chuck for holding the end wall of a container on a container body while a flange of the body and a peripheral portion of the end wall are rolled into a seam comprising a pair of first and second chuck bodies; said first chuck body including a top wall and a bottom wall, an aperture opening through said top and bottom walls, inner and outer side walls between said top wall and said bottom wall; said first chuck body being formed from substantially readily machinable material, said first chuck body being of a substantially annular configuration; said second chuck body being formed from material substantially harder than the material of said first chuck body; said second chuck body including a top wall, a bottom wall and inner and outer side walls between said second chuck body top and bottom walls; said second chuck body being of a substantially annular con figuration with said inner and outer side walls being in relatively downwardly converging relationship to said second chuck body bottom wall, means for bonding said first chuck body bottom wall to said second chuck body top wall to define a unitized chuck, said second chuck body outer side wall having an exterior thin continuous layer of impervious hard material defining an exterior working surface of said chuck, and said first chuck body inner and outer side walls merge in substantially uni-planar relationship with said second chuck body respective inner and outer side walls.

5,813,813

SURGICAL MANIPULATOR

Wolfgang Rudolf Daum, and Jörg Schmiedeke, both of Schwerin, Germany, assignors to Daum GmbH, Schwerin, Germany

Continuation of Ser. No. 670,005, Jun. 25, 1996, abandoned, which is a continuation of Ser. No. 206,450, Mar. 4, 1994, Pat. No. 5,599,151. This application Nov. 3, 1997, Ser. No. 963,084

Claims priority, application Germany, Mar. 4, 1993, 43 06 786.7

Int. Cl.[6] B25J *3/00*

U.S. Cl. 414—7 **10 Claims**

1. A mechanical hand manipulator for use in surgery, comprising:

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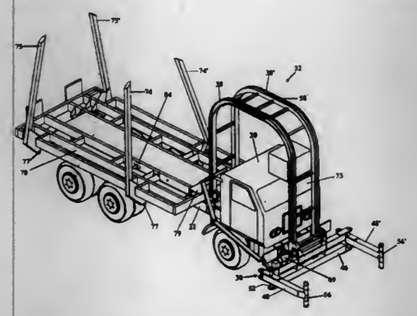
(a) a proximal part having a holder for receiving a human hand including a plurality of human digits;
(b) a distal part having a plurality of independently moveable distal digits, each of said digits having at least one articulation and, wherein said distal part is of a size sufficiently small to pass through a trocar to a surgical site; and
(c) a mechanical coupling portion mounted to said holder at a dorsal aspect of said human hand and connected between said proximal and distal parts to transfer movement between said proximal and distal parts,

said mechanical coupling portion including a moveable interconnection link and a motion reducer.

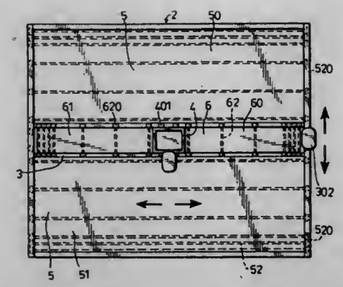
5,813,814
APPARATUS FOR LOADING, TRANSPORTING, AND STACKING BALES
Randall C. Smart, Atwood, Colo., assignor to Justice Enterprises, Inc., Atwood, Colo.
Filed May 16, 1997, Ser. No. 857,412
Int. Cl.[6] A01D *90/08*
U.S. Cl. 414—111 **31 Claims**



1. Apparatus for loading, transporting and stacking bales, said apparatus comprising:
an operator cabs;
said cab having a front portion; an upper portion and a back portion;
a rigid structure extending above said upper portion of said cab;
means for engaging a bale; and
means for moving a bale after said means for engaging a bale have engaged the bale, from a first position proximate said front portion of said cab to said rigid structure above said upper portion of said cab wherein the weight of the bale is supported by said rigid structure above said upper portion of said cab and then to a third position proximate said back portion of said cab.

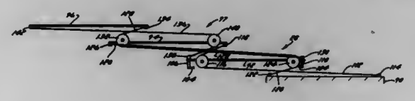
5,813,815
DUST AND WATER PROOF APPARATUS FOR BULK CARRIER
Jin Fang, and Andrew Lew, both of Taipei, Taiwan, assignors to Johnny Yung-Ping Chang, Fremont, Calif.
Filed Nov. 14, 1997, Ser. No. 970,705
Int. Cl.[6] B63B *19/14*
U.S. Cl. 414—137.4 **7 Claims**

1. A dust and water proof apparatus for a bulk carrier, the bulk carrier having four hatch-defining walls which define a cargo hatch thereamong, said dust and water proof apparatus comprising:
a rectangular first frame member having two opposed sidewalls and two opposed end walls which interconnect said sidewalls, each of said sidewalls and said end walls being adapted to be located on a respective one of the hatch-defining walls, each



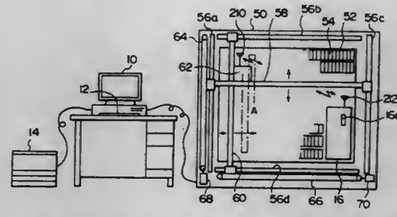
of said sidewalls being formed with an elongated roller-receiving groove that extends longitudinally between said opposed end walls;
a rectangular second frame member disposed among said sidewalls and said end walls of said first frame member, said second frame member having two opposed longer walls which are parallel to said end walls of said first frame member, and two opposed shorter walls which are parallel to said sidewalls of said first frame member, each of said shorter walls having at least two rollers which are mounted rotatably thereon and which extend into said roller-receiving groove of a corresponding one of said sidewalls of said first frame member so that said second frame member is movable relative to said first frame member in a direction parallel to said sidewalls, each of said longer walls being formed with an elongated roller-receiving groove that extends longitudinally between said opposed shorter walls;
a rectangular third frame member disposed among said longer walls and said shorter walls of said second frame member, said third frame member having two opposed roller-mounted walls which are parallel to said longer walls of said second frame member, and two opposed connecting walls which are parallel to said shorter walls of said second frame member and which interconnect said roller-mounted walls, each of said roller-mounted walls having at least two rollers which are mounted rotatably thereon and which extend rotatably into said roller-receiving groove of a corresponding one of said longer walls of said second frame member so that said third frame member is movable relative to said second frame member in a direction parallel to said longer walls of said second frame member;
a first cover unit including a flexible first canopy disposed among said sidewalls of said first frame member, one of said end walls of said first frame member and one of said longer walls of said second frame member, and a flexible second canopy disposed among said sidewalls of said first frame member, the other one of said end walls of said first frame member and the other one of said longer walls of said second frame member, each of said first and second canopies of said first cover unit having a first end portion connected to corresponding one of said end walls of said first frame member and a second end portion connected to corresponding one of said longer walls of said second frame member, each of said first and second canopies of said first cover unit having a plurality of equidistant rods which are fixed thereto and which have opposite ends extending out of two sides thereof, each of said rods having a roller which is mounted rotatably to each of said opposite ends thereof and which extends rotatably into said roller-receiving groove of one of said sidewalls of said first frame member; and
a second cover unit including a flexible first canopy disposed among said longer walls of said second frame member, one of said shorter walls of said second frame member and one of said connecting walls of said third frame member, and a flexible second canopy disposed among said longer walls of said second frame member, the other one of said shorter walls of said second frame member and the other one of said connecting walls of said third frame member, each of said first and second canopies of said second cover unit having a first end portion connected to corresponding one of said shorter walls of said second frame member and a second end portion connected to corresponding one of said connecting walls of said third frame member, each of said first and second canopies of said second cover unit having a plurality of equidistant rods which are fixed thereto and which have opposite ends extending out of two sides thereof, each of said rods having a roller which is mounted rotatably to each of said opposite ends thereof and which extends rotatably into said roller-receiving groove of one of said longer walls of said second frame member.

5,813,816
STORAGE AND RETRIEVAL MACHINE WITH SPRING TENSIONED SHUTTLE PULLEY
Kurt M. Lloyd, Pewaukee, Wis.; Lamar A. Jones, Sandy, Utah, and Wesley A. Crucius, Brookfield, Wis., assignors to HK Systems, Inc., New Berlin, Wis.
Filed Mar. 28, 1996, Ser. No. 623,405
Int. Cl.[6] B66F *9/07*
U.S. Cl. 414—280 **10 Claims**



1. A storage and retrieval machine comprising:
(A) a base configured for horizontal movement with respect to a support surface;
(B) a mast mounted on said base;
(C) a carriage mounted on said mast and configured for vertical movement along said mast;
(D) a shuttle assembly supported on said carriage, said shuttle assembly comprising
(1) a first plate,
(2) a second plate which is positioned above said first plate and which is movable fore and aft with respect to said first plate, said second plate having front and rear end portions and having a slot formed in said rear end portion thereof,
(3) a third plate which is positioned above said second plate and which is movable fore and aft with respect to said first and second plates,
(4) a drive device located on said first plate;
(5) a flexible master drive member which is driven by said drive device and which has a first end affixed to said front end portion of said second plate and a second end affixed to said rear end portion of said second plate,
(6) a first flexible slave drive member having a first end affixed to said first plate and a second end affixed to said third plate, said first slave drive member extending through said slot in said second plate, and
(7) an idler pulley assembly, said idler pulley assembly including
(a) a support frame mounted on said second plate for slidable movement therealong,
(b) an idler pulley which is rotatably mounted on said support frame, which extends through said slot in said second plate, and over which said first slave drive member passes, and
(c) a spring-loaded tensioning mechanism which is mounted on said second plate and which resiliently biases said support frame and said idler pulley rearwardly.

5,813,817
CARRYING DEVICE AND CARRYING METHOD
Takeshi Matsumiya, and Hiroshi Takabayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 9, 1996, Ser. No. 731,002
Claims priority, application Japan, Oct. 9, 1995, 7-286374; Oct. 9, 1995, 7-286375; Oct. 9, 1995, 7-286376
Int. Cl.[6] B65G *1/04*
U.S. Cl. 414—280 **5 Claims**



1. A carrying device having a carrier which pulls out and carries a target material from one of shelves to a target position, the shelves storing a plurality of materials, and which carries back the target material from the target position to the shelf, said carrier comprising:
(a) a guide rod fixed to a casing of said carrier in parallel to a direction to slide said target material in and out;
(b) pick-up means including,
(1) a holder bracket slidably held by said guide rod,
(2) a gripper having claw members for grasping the target material by opening and closing the claw members, said gripper means being held by said holder bracket, and
(3) a push member one end of which is held by said holder bracket, said push member being movable to push said gripper so that said claw members can be opened to engage the target material or closed to remove the target material;
(c) a rail member provided in the casing of said carrier in parallel to said guide rod and horizontally movable in a direction nonparallel to that of said guide rod, on which one end of said push member is slid and pushed to open or close said claw members as the rail member moves;
(d) stroke driving means attached to the casing of said carrier for moving said holder bracket over said guide rod; and
(e) claw opening/closing drive means attached to the casing of said carrier for moving said rail member horizontally in a direction nonparallel to that of said guide rod to open or close said claw members.

5,813,818
MULTI-COMPARTMENT SIDE BUCKET REFUSE COLLECTION SYSTEM
Garwin McNeilus, Dodge Center, Minn.; Ronald E. Christenson, Parsons, Tenn., and Wilbur R. Harris, Rochester, Minn., assignors to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.
Continuation of Ser. No. 596,731, Feb. 5, 1996, abandoned, which is a continuation-in-part of Ser. No. 508,384, Jul. 31, 1995, abandoned. This application Nov. 3, 1997, Ser. No. 963,541
Int. Cl.[6] B65F *3/02*
U.S. Cl. 414—407 **13 Claims**

1. A multi-compartment apparatus for collecting refuse comprising:
(a) a truck body having a forward end and an aft end and a maximum width mountable to a truck frame and extending longitudinally therealong and enclosing a multi-compartment material receiving and storage volume;
(b) an offset multi-compartment charging hopper mountable to the truck frame forward of said truck body and adapted to receive material from a multi-compartment loading bucket

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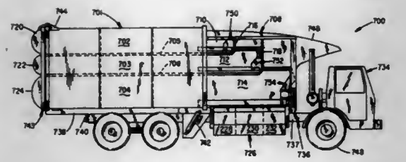


and charge material into said material receiving and storage volume, each charging hopper compartment being aligned to charge material into a corresponding material receiving and storage compartment, and wherein at least one side of said charging hopper is an offset side recessed a sufficient amount to accommodate the full width of a juxtaposed loading bucket within the maximum width of said truck body, said loading bucket being generally vertically operable along said offset side;

(c) a loading bucket carried by said charging hopper and having an extended inner wall and an outer wall flanked by a pair of end walls, and the bucket describing a like number of loading compartments for receiving refuse material, said extended inner wall extending above the level of said outer wall, and said loading bucket being generally vertically moveable along an initially outward extending path along said offset side of said charging hopper between a lowered position and a raised, at least partially inverted, discharge position;

(d) wherein said path along which said bucket moves is fixed relative to said loading hopper and includes a pair of spaced forward and aft shaped elongated recesses having lower segments that are outwardly directed each adapted to receive a pair of upper and lower follower members generally vertically spaced with respect to said bucket and being attached to a corresponding forward or aft wall of said bucket, said followers being slightly offset, the upper follower being outside the lower follower such that in cooperation with the outward directed lower segments of said recesses said bucket is initially vertical but tilts toward said offset side of said charging hopper when said followers are in a vertical path, said path further including an arcuate upper dumping portion and wherein said offset followers cooperate to increase the degree of inversion of said bucket at a fully up or discharging position;

(e) an operable charging hopper lid pivotally attached to said charging hopper and linear operating means for pivoting said charging hopper lid, said charging hopper lid being connected to said loading bucket in a manner such that operation of said charging hopper lid operates said loading bucket; and

(f) wherein each of said charging hopper compartment further comprises linear operating compaction mechanism for charging material deposited therein into a corresponding compartment of said receiving and storage volume.

5,813,819

SUBSTRATE TRANSFER APPARATUS, AND METHOD OF TRANSFERRING SUBSTRATES

Tetu Ohsawa, Sagamihara, and Kiyohisa Tateyama, Kumamoto, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Division of Ser. No. 455,662, May 31, 1995, Pat. No. 5,645,391, which is a continuation of Ser. No. 71,269, Jun. 4, 1993, abandoned. This application Apr. 7, 1997, Ser. No. 833,424

Claims priority, application Japan, Jun. 5, 1992, 4-169891; Jun. 11, 1992, 4-175940

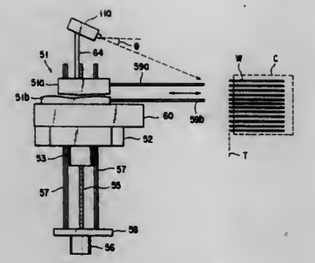
Int. Cl.[6] B65G *49/07*

U.S. Cl. 414—416 **12 Claims**

1. A transfer apparatus in a vertical heat treating system,

said vertical heat treating system comprising,

a container placing section for placing a container in said system, said container holding a plurality of substrates in a stacked state with a distance therebetween,



a heat treating furnace for applying a heat treatment to said substrates, while said substrates are held by a boat in a stacked state with a distance therebetween, and

a boat transport mechanism for transporting said boat between a position in said heat treating furnace and a transfer section outside said heat treating furnace,

said transfer apparatus comprising:

(a) a transfer unit for transferring said substrates from said container placed in said container placing section into said boat placed in said transfer section, said transfer unit having,

(i) a base arranged to be vertically movable and rotatable within a horizontal plane, and

(ii) a plurality of support members arranged on said base to be movable back and forth, for respectively supporting said substrates in a stacked state with a distance therebetween; and

(b) a monitoring mechanism for monitoring movement of said support members, said monitoring mechanism having,

(i) a camera attached to said base to be located at a position above proximal portions of said support members, and having a field of view whose optical axis is inclined downward to face a side to which said support members are moved forward, wherein said camera is arranged such that front ends of said substrates in said container are disposed in said field of view to observe said front ends one above another and to observe a positional relationship between said front ends and said support members, when said substrates in said container placed in said container placing section are taken out by said support members, and

(ii) a display for displaying data obtained by said camera.

5,813,820

APPARATUS AND METHOD FOR MOUNTING A FORKLIFT ON A CARRIER

William R. Dubosh, Pickerington; John R. Mauck, Galloway; Paul W. Neagle, Westerville, and Lonnie A. Wilson, Rockbridge, all of Ohio, assignors to Teledyne Princeton, Inc., Canada

Continuation-in-part of Ser. No. 429,357, Apr. 26, 1995, Pat. No. 5,575,604. This application Sep. 20, 1996, Ser. No. 717,458

Int. Cl.[6] B66F *9/06*

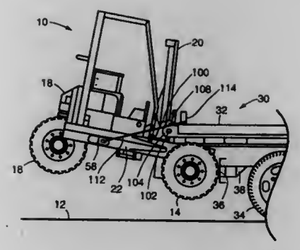
U.S. Cl. 414—467 **4 Claims**

1. In combination, a forklift and a carrier secured together to allow said forklift to be transported from one site to another by said carrier,

said forklift including a forklift frame having front and rear wheels,

a pair of forks mounted on a carriage, said carriage being mounted to reciprocate vertically on a vertically extending mast by a pressurized hydraulic system, said mast being supported by said frame,

said carrier including a carrier frame supported by wheels, at least one fork-receiving pocket mounted on said carrier frame, a pair of front wheel abutments mounted below said carrier frame to engage and limit forward movement by said front forklift wheels,



at least one of said forks being disposed in said at least one fork-receiving pocket, a lock securing said forklift to said carrier,

said hydraulic system being under no gauge pressure and said forks exerting no vertical force on said pocket, said lock being the sole upward force applied to said forklift,

said lock being a hook disposed on said forklift frame and a bar disposed on said carrier frame.

5,813,821

MOTORIZED LIFT TRUCK ADAPTED TO BE LOADED ON THE REAR OF A CARRYING VEHICLE

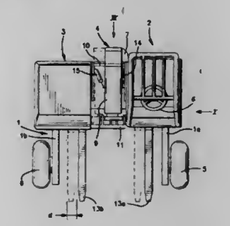
Marcel Claude Braud, Champtoceaux, France, assignor to Manitou BF, Ancenis, France

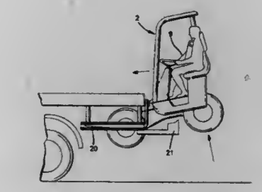
Filed Sep. 14, 1995, Ser. No. 528,300

Claims priority, application France, Sep. 14, 1994, 94 10953; Jan. 4, 1995, 95 00033

Int. Cl.[6] B66F *9/00*

U.S. Cl. 414—667 **12 Claims**





7. In a motorized lift truck with a telescopic arm, comprising a chassis mounted on a plurality of wheels of which at least one is power driven, said chassis carrying a motor propulsion group and a cab and lifting means disposed between the motor propulsion group and the cab, said lifting means comprising said telescopic arm, said telescopic arm being pivotally mounted about a substantially horizontal axle; the improvement wherein the lifting means comprising the telescopic arm is displaceable transversely along said substantially horizontal axle under the action of actuating means disposed adjacent said horizontal axle, so as to permit precise adjustment along a predetermined distance (d) of the transverse position of the lifting means so as to engage a load.

5,813,822

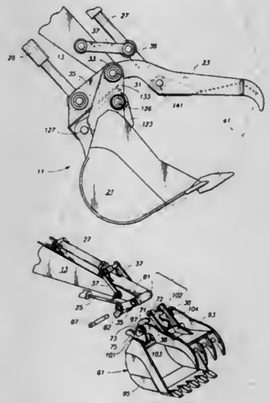
BUCKET AND THUMB COMBINATION AS A QUICK DECOUPLING ATTACHMENT

Walter J. Pisco, Woodinville, Wash., assignor to Pacific Services & Manufacturing, Woodinville, Wash.

Filed Jan. 9, 1997, Ser. No. 780,971

Int. Cl.[6] E02F *3/40*

U.S. Cl. 414—723 **6 Claims**



1. A two-part implement combination for attachment to an excavator arm, comprising:

a releasable quick coupling mechanism pivotably attached to the excavator arm and actuated for pivotal movement relative to the arm about a first axis;

a first implement part attachable to the arm by the releasable quick coupling mechanism for pivotal movement relative to the arm about the first axis;

a second implement part pivotally attached to the first implement part for independently-actuated pivotal movement relative to the first implement part and the arm about an axis substantially co-extensive with the first axis.

5,813,823

ARTICULATED ARM TRANSFER DEVICE

Christopher Hofmeister, 176 Wheetwright Rd., Hampstead, N.H. 03841

Division of Ser. No. 434,012, May 3, 1995, Pat. No. 5,720,590, which is a continuation of Ser. No. 48,833, Apr. 16, 1993, abandoned. This application Oct. 30, 1996, Ser. No. 740,496

Int. Cl.[6] B25J *9/12*

U.S. Cl. 414—744.5 **16 Claims**

1. A transport apparatus having a movable arm assembly operably connected to a drive mechanism, the drive mechanism comprising:

a housing having a chamber;

electromagnetic stators stationarily connected to the housing at different heights relative to the chamber, the stators being located outside of the chamber;

a drive shaft assembly located, at least partially, in the chamber, the assembly including two independently rotatable coaxial shafts, a first one of the shafts extending coaxially through a second one of the shafts, one of the shafts having a set of permanent magnets that are aligned with a first one of the electromagnetic stators; and

a first brake system having two disks separately connected respectively to the two coaxial shafts, wherein a first one of the disks is located at a second one of the electromagnetic stators and, when the second electromagnetic stator is ener-

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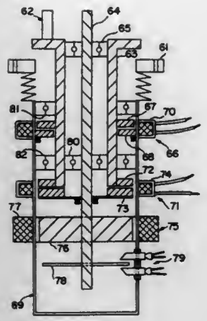
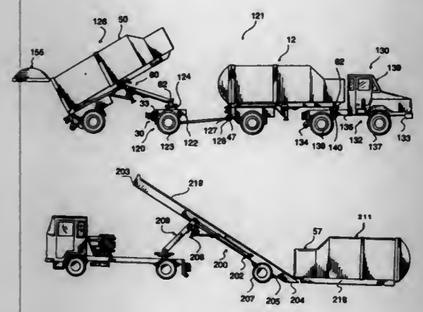


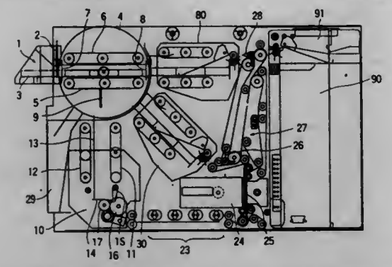
gized, the first disk is magnetically moved into contact with a second one of the disks to lock the two coaxial shafts to each other.

5,813,824
METHOD OF COLLECTING REFUSE
Jerald G. Zanzig, Signal Mountain, Tenn.; Marcel G. Stragier, and John W. Pickrell, both of Scottsdale, Ariz., assignors to The Heil Company, Chattanooga, Tenn.
Division of Ser. No. 485,274, Jun. 7, 1995, abandoned, which is a division of Ser. No. 271,194, Jul. 7, 1994, Pat. No. 5,551,824. This application May 13, 1997, Ser. No. 855,384
Int. Cl.[6] B65F *3/00*
U.S. Cl. 414—786 **5 Claims**



1. A method of collecting refuse comprising the steps of:
coupling a first semi-trailer having a frame carrying a refuse collection body, to a vehicle having a fifth wheel;
depositing refuse into said refuse collection body by engaging and emptying a refuse container with a loading mechanism carried by one of said vehicle and said first semi-trailer;
uncoupling said first semi-trailer from said vehicle at a transfer site when said first semi-trailer contains refuse;
coupling a second semi-trailer to said vehicle for further refuse collection;
collecting refuse within said second semi-trailer;
returning to said transfer site and uncoupling said second semi-trailer;
coupling one of said first and second semi-trailers to a dolly;
coupling said dolly to the other one of said first and second semi-trailers; and
transporting said first and second semi-trailers to a disposal site.

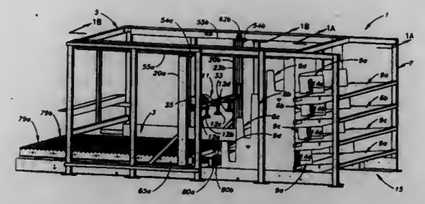
5,813,825
BILL HANDLING MACHINE
Junichi Arikawa, Kawaguchi; Yoshiyuki Katoh, Tokyo; Toru Inage, Kasukabe; Wataru Iida, Matsudo, and Hideo Atsumi, Sayama, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1997, Ser. No. 796,535
Claims priority, application Japan, Feb. 29, 1996, 8-043530
Int. Cl.[6] B65H *29/22*
U.S. Cl. 414—790.5 **6 Claims**



1. A bill handling machine provided with a bill hold and transport means which can hold bills therebetween and transport them downwardly and a bill receiving device for receiving the bills, the bill receiving device comprising endless drive belt means fixed and extending vertically, endless driven belt means movable relative to the endless drive belt means and extending vertically so as to hold the bills fed from the bill hold and transport means between itself and the endless drive belt means, a bill press member supported integrally with the endless driven belt means, movable between a projected position where it is closer to the endless drive belt means than surfaces of the endless driven belt means on a side of the endless drive belt means and a retracted position where it is more apart from the endless drive belt means than the surfaces of the endless driven belt means on a side of the endless drive belt means and biased toward the endless drive belt means, and a plate member located below the endless drive belt means and the endless driven belt means, the bill handling machine further comprising control means for conducting control so as to locate the bill press member at the retracted position, holding the bills fed from the bill hold and transport means between the endless driven belt means and the endless drive belt means by moving the endless driven belt means toward the endless drive belt means, lower the bills until the bills are no longer held by the bill hold and transport means, then hold the bills between the bill press member and the endless drive melt means by moving the bill press member to the projected position, release the bills held by the endless driven belt means and the endless drive belt means by moving the endless driven belt means apart from the endless drive belt means, and release the bills held between the bill press plate and the endless drive belt means to drop them onto the plate member.

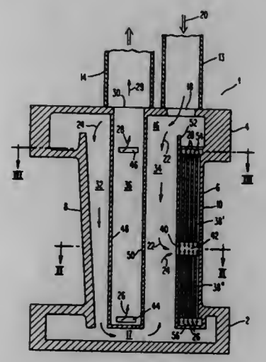
5,813,826
BOTTOM SHEET DISPENSER FOR LOAD FORMING MACHINERY
Merrill D. Martin, Oakland, and Daniel J. Talken, Lafayette, both of Calif., assignors to Martain Family Trust, Oakland, Calif.
Filed Feb. 21, 1997, Ser. No. 802,993
Int. Cl.[6] B65G *59/04*
U.S. Cl. 414—797 **19 Claims**

19. A bottom sheet storage and feeder apparatus for selecting from a plurality of selectively sized and selectively positioned bottom sheets and sequentially moving one or more of said individual bottom sheets longitudinally to a generally horizontal destination location in a plurality of generally horizontal lay down patterns comprising:
a. a frame;



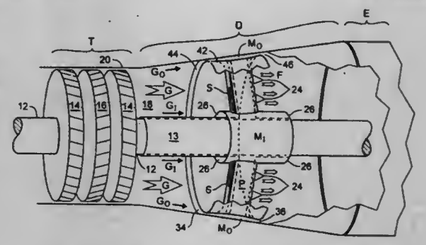
b. a plurality of vertically spaced storage bins mounted on said frame, each of said vertically spaced storage bins having a base and storing a plurality of selected size bottom sheets on said bases and said vertically spaced storage bins being vertically arranged;
c. a lifting assembly including a vacuum member mounted on said lifting assembly dimensioned to selectively move for engaging and lifting at least an individual bottom sheet from any one or more of said vertically spaced storage bins; and
d. a transfer assembly connected to said lifting assembly for delivering said selected bottom sheet to said generally horizontal destination location in a selected generally horizontal lay down pattern.

5,813,827
APPARATUS FOR COOLING A GAS TURBINE AIRFOIL
Raymond Scott Nordlund, Orlando; Kent Goran Hultgren, Winter Park; Robert Kenmer Scott, Geneva; Zachary Sinnott, Winter Park; William Edward North, Winter Springs, all of Fla., and Steven Douglas Ward, Cincinnati, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 15, 1997, Ser. No. 843,414
Int. Cl.[6] F01D *5/18*
U.S. Cl. 415—115 **17 Claims**



1. An airfoil for a turbomachine, comprising:
a) a leading edge and a trailing edge;
b) first and second ends, said first end disposed radially outward from said second end;
c) first and second side walls;
d) a first passage formed between said first and second sidewalls, said first passage having an inlet for receiving a flow of a cooling fluid directed to said airfoil;
e) a plenum formed between said side walls and disposed between said first and second ends, said plenum in flow communication with said first passage;
f) a plurality of second passages in flow communication with said plenum, said second passages extending in a substantially radial direction from said plenum toward said first end; and
g) a plurality of third passages in flow communication with said plenum, said third passages extending in a substantially radial direction from said plenum toward said second end.

5,813,828
METHOD AND APPARATUS FOR ENHANCING GAS TURBO MACHINERY FLOW
Thomas R. Norris, 15 Patricia Rd., Orinda, Calif. 94563
Filed Mar. 18, 1997, Ser. No. 820,220
Int. Cl.[6] F01D *9/04;9/06*
U.S. Cl. 415—115 **10 Claims**



1. In an outlet from a turbo machine having a wall defining a diffuser conduit for routing gas, the improvement comprising:
the diffuser conduit defining an expanding flow path in the direction of gas flow;
a strut having a hollow interior, the strut fastened to the wall of the diffuser conduit, the strut extending from the wall of the diffuser conduit to a low static pressure, high velocity flow area within the diffuser conduit;
a collection duct having a substantially continuous inlet within the diffuser communicated to a high static pressure, low flow velocity area within the diffuser conduit adjacent the wall defining the diffuser conduit, the collection duct having an outlet into the hollow interior of the strut; and,
means for discharging gas on the strut from the hollow interior of the strut to the low static pressure, high velocity flow area of the diffuser conduit.

5,813,829
DISENGAGEABLE MANUAL DRIVE FOR ROTATING A TURBOMACHINE ROTOR
Patrice Mazzotta, Vigneux sur Seine, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma", Paris, France
Filed Jun. 28, 1996, Ser. No. 672,915
Claims priority, application France, Jun. 28, 1995, 95 07754
Int. Cl.[6] F01D *25/34*
U.S. Cl. 415—123 **5 Claims**

1. In a turbomachine including a rotor, a shaft connected to said rotor to rotate therewith, a casing housing said shaft, and a non-circular socket being provided in the end of said shaft, said casing having a wall provided with an opening, said opening being provided facing the end of said shaft thereby permitting access to said shaft, and a manually operable drive means for rotating said rotor, said manually operable drive means comprising:
a removable holder mounted in said opening;
a driving shaft held in said removable holder; said driving shaft being axially movable, said driving shaft having an end formed as a male non-circular end having a shape complementary to that of the socket in the end of the shaft, so that the end of said driving shaft can be introduced into said socket by axial movement of said drive shaft towards said shaft, said driving shaft having an outer end, said outer end having a non-circular socket for the insertion of a removable member for rotating by hand said driving shaft;

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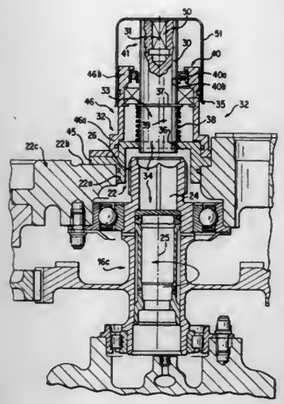


means for automatically disengaging said driving shaft from said shaft; and

sealing means for effecting at least a static seal between said driving shaft and said holder at least when said driving shaft is disengaged from said shaft.

5,813,830

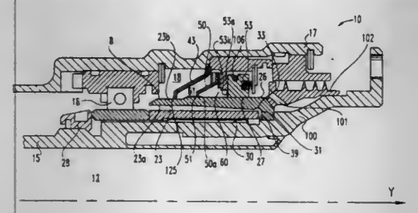
CARBON SEAL CONTAMINANT BARRIER SYSTEM

Joseph C. Smith, Plainfield; Mark E. Bowman, New Palestine, and Joseph D. Black, Brownsburg, all of Ind., assignors to Allison Engine Company, Inc., Indianapolis, Ind.

Filed Feb. 9, 1996, Ser. No. 599,028

Int. Cl.[6] F04D *29/08*

U.S. Cl. 415—170.1 **35 Claims**



1. In combination:

a gas turbine engine;

a mechanical housing within said gas turbine engine;

a shaft rotatably mounted within said housing;

a carbon seal connected to said housing;

a seal runner connected to said shaft, said seal runner arranged adjacent to said carbon seal to form a substantially fluid tight seal therebetween;

a lip seal contacting said seal runner; and

a baffle spaced from said lip seal and positioned around said seal runner.

5,813,831

CENTRIFUGAL BLOWER HAVING A BELL-MOUTH RING FOR REDUCING NOISE

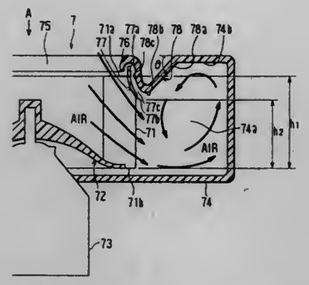
Kouji Matsunaga, Kariya; Koji Ito, Nagoya; Teruhiko Kameoka, Okazaki, and Kazutoshi Kuwayama, Nakashima-gun, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Mar. 10, 1997, Ser. No. 813,460

Claims priority, application Japan, Mar. 11, 1996, 8-053351

Int. Cl.[6] F04D *29/44*

U.S. Cl. 415—173.6 **7 Claims**



1. A centrifugal blower comprising:

a centrifugal multi-blade fan having a plurality of blades around a rotation axis thereof, said multi-blade fan sucking air axially from a suction port side and blowing the sucked air radially outwardly;

a casing for accommodating said centrifugal multi-blade fan and forming an air path for said air blown from said centrifugal multi-blade fan, said casing being formed in a spiral shape around said rotation axis of said centrifugal multi-blade fan and having a suction port opened at said suction port side;

driving means disposed at a driving means side of said multi-blade fan for driving said centrifugal multi-blade fan;

an annular shroud formed on said blades at said suction port side and having a cross sectional shape along a flow of air deflecting radially outwardly from said suction port, said annular shroud including a projection protruding from an upper end portion of said blades and extending toward said suction port;

a bell-mouth opening formed on said casing in such a manner that it curves outwardly from a peripheral edge of said suction port to the upper end portion of said blades to surround said projection of the annular shroud;

a bell-mouth ring disposed proximately at an outer radial side of said shroud and having a deflection wall surface for deflecting a flow of air blown radially inwardly toward said rotation axis along an inner wall surface of a suction port side wall of said casing toward said driving means, wherein

said bell-mouth ring is formed on said suction port side wall of said casing in such a manner that the deflection wall surface slants from the suction port side toward the driving means side radially inwardly; and

said bell-mouth ring has a surface facing said annular shroud which is curved such that a gap between said shroud and said surface is substantially constant.

5,813,832

TURBINE ENGINE VANE SEGMENT

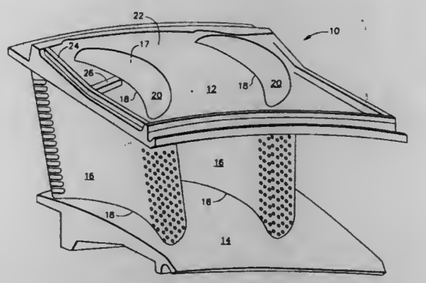
L. Timothy Rasch, Fairfield; John P. Heyward, Loveland, and Jeffrey J. Reverman, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 5, 1996, Ser. No. 759,544

Int. Cl.[6] F01D *1/02*

U.S. Cl. 415—200 **8 Claims**

1. An improved turbine engine vane segment comprising a plurality of segment members including at least one airfoil member



and first and second spaced apart band members including an airfoil shaped opening, the airfoil member being carried between the spaced apart band members, the airfoil member being held at airfoil ends with the first and second band members at metallic bonds therebetween, the improvement wherein:

at least one segment member, but not all segment members, is an improved member having a directionally oriented cast Ni base superalloy microstructure with a first stress rupture strength and a first coefficient of thermal expansion;

the balance of the segment members having a conventionally cast substantially equiaxed alloy microstructure with a second stress rupture strength less than the first stress rupture strength and a second coefficient of thermal expansion different from the first coefficient of thermal expansion; and,

a metallic bond is provided between the improved member and the balance of the segment members, the bond including a brazed structure having a strength which will carry stresses applied during expansion and contraction of the members having the differing first and second coefficients of thermal expansion at the bond without significant detrimental distortion of the segment members.

5,813,833

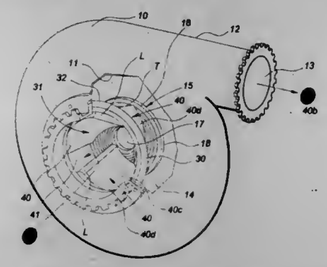
HIGH CAPACITY, LARGE SPHERE PASSING, SLURRY PUMP

Graeme R. Addie, and Robert J. Visintainer, both of Augusta, Ga., assignors to GIW Industries, Inc., Grovetown, Ga.

Filed Aug. 29, 1996, Ser. No. 703,948

Int. Cl.[6] F04D *29/44*

U.S. Cl. 415—206 **22 Claims**



1. A centrifugal pump adapted to pump a slurry of water and solids therethrough, said pump comprising:

a shell in the form of a semi-volute collector formed about a central axis, said shell having:

a substantially circular front wall and a spaced substantially circular back wall;

a generally continuous outer side wall extending between said front wall and said rear wall;

a discharge nozzle disposed tangentially with respect to said side wall;

a discharge opening at a terminal end of said discharge nozzle;

a circular suction inlet defined in said front wall about said axis for allowing the slurry to enter said shell;

an impeller rotatably supported within said shell about said central axis, said impeller including:

a circular back shroud;

a spaced parallel annular shroud; and

a plurality of vanes each having a proximal end fastened to said back shroud, a spaced distal end fastened to said annular shroud, a leading edge extending between said proximal and distal ends and inclined in a direction of said impellers' path of rotation about said axis, and a spaced trailing edge, said vanes being equally spaced from each other and defining impeller channels therebetween;

a circular opening defined by said annular shroud about said central axis in fluid communication with said suction inlet, said circular opening having a diameter approximately equal to the diameter of said suction inlet; and

a central shaft rotatably supported on said shell and extending along said axis, said shaft being operably engaged with said back shroud for rotating said impeller about said axis;

wherein said proximal end of each vane extends along an arc of approximately 105° from said trailing edge to said leading edges said distal end of each vane extends along an arc of approximately 80° from said trailing edge to said leading edge, and each respective one of said impeller channels is sized and shaped to pass at least one of the solids therethrough.

5,813,834

CENTRIFUGAL FAN

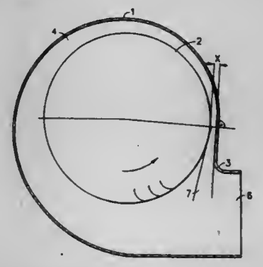
Reinhold Hopfensperger, Magersdorf, and Rudolf Tungl, Ergolding, both of Germany, assignors to Motoren Ventilatoren Landshut GmbH, Landshut, Germany

Filed Jan. 15, 1997, Ser. No. 784,007

Claims priority, application Germany, Jan. 24, 1996, 196 02 368.8

Int. Cl.[6] F04D *29/44*

U.S. Cl. 415—206 **13 Claims**



1. A centrifugal fan comprising:

a casing with a spiral-shaped outer contour;

at least one circular lateral inlet opening;

a tangential outlet opening;

a drum impeller rotatably mounted in the casing and coupled to an electric motor such that a pressure space having a volume is formed between a circumference of the drum impeller and an inner contour of the casing; and

flat blades attached to the drum impeller;

wherein a shortest distance between the circumference of the drum impeller and the inner contour of the casing is approximately 1 to 5% of a diameter of the drum impeller;

wherein a location of the shortest distance between the circumference of the drum impeller and the inner contour of the casing is shifted from the outlet opening in a direction of rotation of the drum impeller; and

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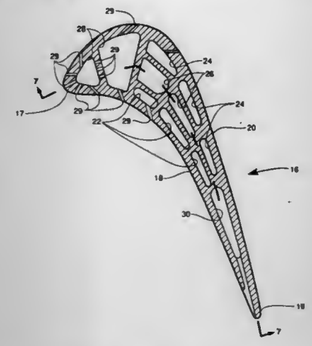
wherein a distance between the circumference of the drum impeller and the inner contour of the casing is steadily increased from the location of the shortest distance therebetween toward the outlet opening to form a wedge-shaped space.

5,813,835
AIR-COOLED TURBINE BLADE

Robert J. Corsmeier; Harvey M. MacLin, and Ching-Pang Lee, all of Cincinnati, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1991, Ser. No. 746,688
Int. Cl.[6] B63H *1/14;* **F01D** *5/14*
U.S. Cl. 416—97 R **9 Claims**

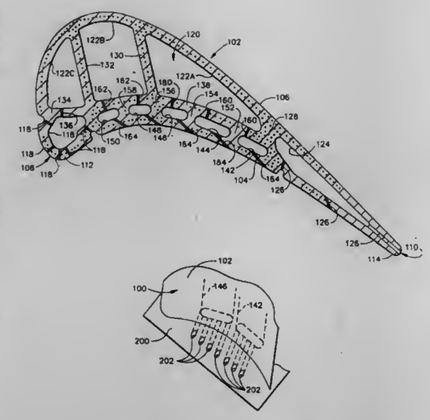


1. An air-cooled turbine blade, comprising:
a root having an upper platform;
an airfoil shaped body formed integrally with said platform, said body having a convex side and a concave side, a leading edge and a trailing edge;
a first cooling passage within said body adjacent said convex side;
a second cooling passage within said body adjacent said concave side;
a third cooling passage within said body intermediate said first and second cooling passages;
means for admitting cooling air into said first and second cooling passages;
a cooling passage within said platform having an outlet;
means for admitting cooling air into said platform cooling passage; and
an orifice located at said outlet for providing fluid communication between said platform cooling passage and said third cooling passage.

5,813,836
TURBINE BLADE

John H. Starkweather, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 24, 1996, Ser. No. 773,451
Int. Cl.[6] F01D *5/18*
U.S. Cl. 416—97 R **17 Claims**

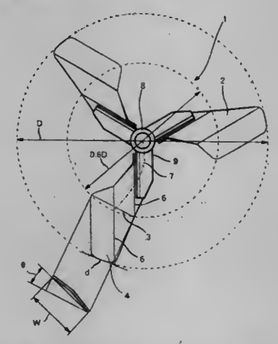


8. A turbine blade comprising:
a base section comprising a cooling conduit and a platform; and
an airfoil section comprising a pressure side wall and a suction side wall, a serpentine cooling passageway located within said airfoil section for permitting airflow from said base section cooling conduit into and through said airfoil section, a wall located between said serpentine cooling passageway and said pressure side wall, a plurality of impingement cavities located between said wall and said pressure side wall, a leading edge cavity having a plurality of radial film holes, said leading edge cavity in flow communication with said serpentine cooling passageway, and a trailing edge cavity to cool a trailing edge flow region, at least one of said impingement cavities extending radially to said platform, a plurality of film holes extending through said platform from said at least one impingement cavity.

5,813,837
AXIAL-FLOW IMPELLER FOR MIXING LIQUIDS

Masafumi Yamamoto, Kakogawa, and Yukimichi Okamoto, Kobe, both of Japan, assignors to Shinko Pantec Kabushiki Kaisha, Hyogo, Japan

Filed Oct. 17, 1996, Ser. No. 732,890
Claims priority, application Japan, Nov. 1, 1995, 7-285066; Aug. 12, 1996, 8-212448
Int. Cl.[6] F04D *29/38*
U.S. Cl. 416—223 R **2 Claims**

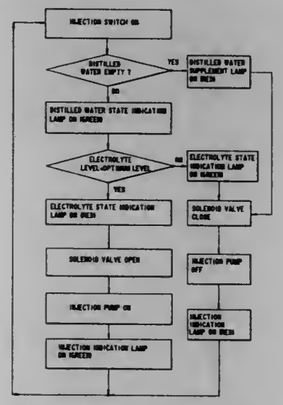


1. An axial-flow impeller having a plurality of blades mounted on a shaft rotatably for mixing liquids, each of said blades including (1) a leading edge and a trailing edge with respect to the direction of rotation of said blades, (2) a radial position defined by the position in the radial direction when the impeller shaft center is designated as 0 and the blade tip end is designated as 1, (3) a blade width defined by the linear distance between said leading edge and said trailing edge at the same radial position from said shaft, (4) a pitch angle defined by the angle formed between the straight line used to define said blade width and a plane perpendicular to said shaft, (5) a blade root defined at a mounting joint between said blade and said shaft, and (6) a blade tip end portion at the radial end of said blade, each of said blades comprising:
(a) the maximum blade width is less than 20% of the impeller diameter;
(b) the pitch angle at the radial position 0.6 is 15°–20°;
(c) the width at the blade tip end portion is 25–75% of the blade width at the radial position 0.6, and at the same time the pitch angle at the blade tip end portion is 5°–10° smaller than the pitch angle at the radial position 0.6; and
(d) the blade width at the blade root is 40% or more of the blade width at the radial position 0.6, and at the same time the pitch angle at the blade root is 40°–45°.

5,813,838
OPTIMUM ELECTROLYTE LEVEL SENSING METHOD AND THE AUTOMATIC TOPPING UP APPARATUS FOOR STORAGE WET CELL

Bae Sang-Min, Gasuwon-Dong; Son Young-Joon, and Lee Jae-Won, both of Eoeun-Dong, all of Rep. of Korea, assignors to Korea Atomic Energy Research Institute, Daejeon-Si, Rep. of Korea

Filed Nov. 2, 1995, Ser. No. 556,837
Claims priority, application Rep. of Korea, Jun. 2, 1995, 1995-14639
Int. Cl.[6] F04B *49/00*
U.S. Cl. 417—18 **1 Claim**

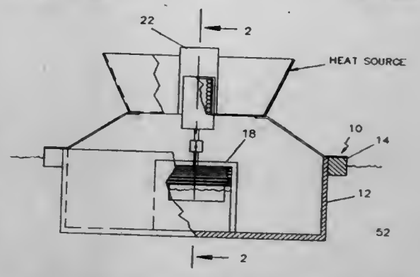


1. An automatic topping up method of a storage wet cell consisting of electrolyte and distilled water, wherein said method comprising the steps of:
providing a movable automatic distilled water injection apparatus for storage cells;
sensing a distilled water level in a distilled water storage vessel of said movable automatic distilled water injection apparatus by means of a lead switch operated by a permanent magnet float sensor;
determining the amount of electrolyte in said storage wet cell by a difference between the conductivity of said electrolyte and said distilled water in said storage wet cell;
automatically activating a pump and a solenoid valve to supply distilled water into said storage wet cell when the amount of electrolyte in said storage wet cell is insufficient and when the sensed distilled water level in said distilled water storage vessel is above a predetermined level; and
automatically stopping said pump and said solenoid valve to terminate supplement of distilled water upon an optimum amount of electrolyte being determined or when the sensed distilled water level in said distilled water storage vessel falls below a predetermined level.

5,813,839
GAS DRIVEN EXTERNAL COMBUSTION HEAT ENGINE PUMP HAVING THE OUTLET PIPE CONNECTED TO A VARIABLE BUOYANT FLOAT

John C. Newby, P.O. Box 989, Cobb, Calif. 95426

Filed May 27, 1997, Ser. No. 863,787
Int. Cl.[6] F04B *53/00*
U.S. Cl. 417—61 **4 Claims**



1. An external combustion heat engine pump mechanism adapted to float the surface of a reservoir of liquid, said heat engine pump comprising:
(a) an enclosure provided with a float and within said enclosure are located four chambers one liquid pumping chamber, one gas pumping chamber, one cooling chamber and one heating chamber with attached heat source;
(b) said liquid pumping chamber further having a gas input pipe permitting communication between said liquid pumping chamber and said heating chamber, a liquid orifice permitting communication between said liquid reservoir and said liquid pumping chamber, a liquid orifice permitting communication between said liquid pumping chamber and said gas pumping chamber, a gas orifice permitting communication between said liquid pumping chamber and said gas pumping chamber, a liquid output orifice located on a lower wall of liquid pumping chamber, a hollow cycling container, buoyant when nearly empty, coupled to said output orifice with said output pipe permitting communication between said cycling container and output pipe;
(c) said cycling container adapted to sink when pump liquid rises above a predetermined level within said liquid pumping chamber;
(d) first swivel joint means coupled to said cycling container and output pipe to allow vertical circular arc travel of said cycling container, as liquid rises, or when said cycling container sinks;
(e) first check valve means associated with said liquid orifice to allow one way flow of liquid into said liquid pumping chamber from said reservoir;
(f) said gas pumping chamber further having a liquid orifice permitting communication between said gas pumping chamber and said liquid pumping chamber, gas orifice permitting communication between said gas pumping chamber and said liquid pumping chamber, a bellows with attached float, installed within said gas pumping chamber ceiling with lower end of said bellows unattached;
(g) second check valve means associated with said gas orifice to allow one way flow of gas into said heating chamber from said bellows;
(h) attachment means for securing float to said bellows;
(i) said heating chamber further having a gas orifice permitting communication between said heating chamber and said liquid pumping chamber, said gas orifice permitting communication between said heating chamber and said bellows;

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(j) said cooling chamber further having a gas outlet orifice permitting communication between said cooling chamber and said bellows, outer surface of said cooling chamber to be coated with reflective paint;

(k) third check valve means associated with said gas outlet orifice for allowing one way flow of gas into said bellows from said cooling chamber; and

(l) construction means for installing coiled thin wall tubing with water sealed inside said tubing the length of said cooling chamber.

5,813,840

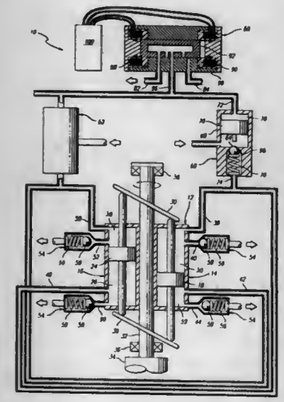
Patent Not Issued For This Number

5,813,841

HYDRAULIC PRESSURE CONTROL SYSTEM FOR A PUMP

Oded E. Sturman, Woodland Park, Colo., assignor to Sturman Industries, Woodland Park, Colo.

Filed May 16, 1996, Ser. No. 648,681
Int. Cl.[6] F04B *7/00*
U.S. Cl. 417—446 **6 Claims**



1. A pump, comprising:

a pump housing with a first chamber and a second chamber;

a first piston that separates said first chamber into a first pump chamber and a second pump chamber;

a second piston that separates said second chamber into a third pump chamber and a fourth pump chamber;

a pair of wobble plates that move said first and second pistons in a reciprocating motion;

a first inlet port coupled to said first pump chamber, a second inlet port coupled to said second pump chamber, a third inlet port coupled to said third pump chamber and fourth inlet port coupled to said fourth pump chamber;

a first hydraulically controlled inlet check valve that controls the flow of a pump fluid through said first and third inlet ports;

a second hydraulically controlled inlet check valve that controls the flow of the pump fluid through said second and fourth inlet ports; and,

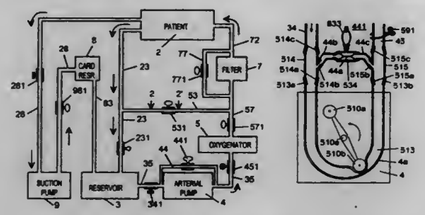
a solenoid control valve that controls said first and second hydraulically controlled inlet check valves to regulate a reverse flow of pumping fluid through said inlet ports to control an output pressure of the pump.

5,813,842

PRESSURE SENSITIVE VALVES FOR EXTRACORPOREAL PUMPING-3

Yehuda Tamari, 21 Singworth St., Oyster Bay, N.Y. 11771-3703

Continuation-in-part of Ser. No. 852,931, Mar. 13, 1992, Pat. No. 5,186,431, which is a continuation of Ser. No. 683,093, Apr. 10, 1991, abandoned, which is a continuation of Ser. No. 410,845, Sep. 22, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 474,266
Int. Cl.[6] F04B *43/08*
U.S. Cl. 417—477.1 **22 Claims**



1. A system for dynamically setting pump occlusion for an extracorporeal roller pump nonocclusively, said system comprising:

(a) a roller pump having at least two rollers for sequentially occluding a first tubing member to pump an extracorporeal fluid there through, said first tubing member having a pump inlet and a pump outlet;

(b) a first means on said roller pump for setting pump occlusion;

(c) a second tubing member for fluid interconnection of said pump outlet and said pump inlet;

(d) a pressure relief valve for closing said second tubing member below a predetermined pressure;

(e) a second means for indicating fluid flow from said pump outlet to said pump inlet;

(f) a third means for clamping the pump outlet distal to said second tubing member;

whereby a desired occlusion may be obtained by clamping the pump outlet with said third means, and adjusting the setting of said first means to generate a pump pressure equal to said predetermined pressure.

5,813,843

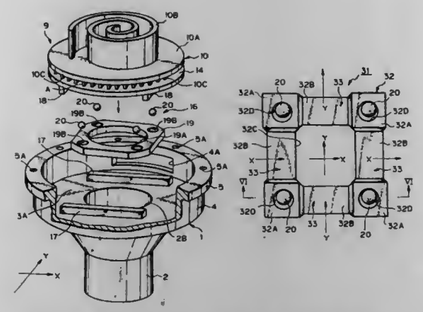
SCROLL-TYPE FLUIDIC MACHINE HAVING A SLIDER FOR AXIAL THRUST AND ROTATION PREVENTION

Kazutaka Suefuji, Kanagawa-ken; Yuji Komai, Tokyo; Yoshio Kobayashi, Kanagawa-ken; Hiroyuki Mihara, Kanagawa-ken, and Toshitugu Suzuki, Kanagawa-ken, all of Japan, assignors to Tokico Ltd., Kanagawa-Ken, Japan

Division of Ser. No. 652,386, May 23, 1996, abandoned. This application Jun. 11, 1997, Ser. No. 873,171
Claims priority, application Japan, May 24, 1995, 7-149445
Int. Cl.[6] F01C *1/04;* **F16D** *3/04*
U.S. Cl. 418—55.3 **4 Claims**

1. A scroll-type fluidic machine comprising a casing, a fixed scroll member integrally mounted on said casing, a drive shaft rotatably supported by said casing and having one end formed as a crank, an orbiting scroll member rotatably attached to said crank of said drive shaft so that a plurality of compression chambers are defined between said orbiting scroll member and said fixed scroll member, and a rotation preventing mechanism for preventing rotation of said orbiting scroll member, wherein said rotation preventing mechanism comprises;

a slider disposed between said casing and said orbiting scroll member and slidable in two directions perpendicular to each other, relative to said casing and said orbiting scroll member, respectively, said slider having a generally rectangular configuration having a first pair of opposite side surfaces and a second pair of opposite side surfaces;



guide members formed on said casing for guiding said slider in one of said two directions by sliding engagement with said slider in one of said two directions by sliding engagement with said first pair of opposite side surfaces of said slider;

guide members formed on said orbiting scroll member for guiding said orbiting scroll member for movement relative to said slider in the other of said two directions by sliding engagement with said second pair of opposite side surfaces of the slider; and

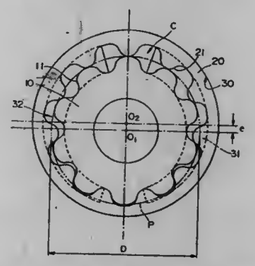
said slider having a central opening for allowing connection between said orbiting scroll member and said drive shaft and including a plurality of thick portions spaced from each other in the circumferential direction of said orbiting scroll member and thin portions therebetween for forming cooling air passages which extend from outside of said slider to said central opening.

5,813,844

OIL PUMP ROTOR HAVING A GENERATED TOOTH SHAPE

Katsuaki Hosono, and Manabu Katagiri, both of Niigata, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Dec. 12, 1996, Ser. No. 764,811
Claims priority, application Japan, Dec. 14, 1995, 7-326108; Jan. 17, 1996, 8-006172; Jan. 17, 1996, 8-006174
Int. Cl.[6] F04C *2/10*
U.S. Cl. 418—150 **14 Claims**



1. An oil pump rotor for an oil pump provided with an inner rotor to which n (n is a natural number) outer teeth are formed, an outer rotor to which n+1 inner teeth are formed which engage with each of the outer teeth, and a casing in which an intake port for taking up fluid and an expulsion port for expelling fluid are formed, fluid being taken up and expelled in this oil pump by means of changes in the capacity of a plurality of cells which are formed between the teeth surfaces of each rotor during the engagement and rotation of the rotors, wherein:

the outer teeth of the inner rotor are formed along an envelope described by a generated group of circles having centers positioned on a trochoid curve generated within the limits satisfying the following expression:

$$0.15 \leqq n \cdot R/(p \cdot D) \leqq 0.25$$

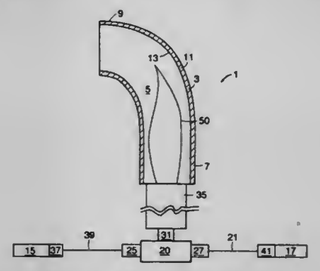
where D is the diameter of the circle which passes through each of the tips of the outer teeth and R is the radius of the generated circle measured in millimeters, while p is π.

5,813,845

CURVED SILICON-CARBIDE BASED BURNER NOZZLE FOR USE WITH GASEOUS FUEL FLAMES

Richard Eiermann, Worcester, Mass., assignor to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed Dec. 4, 1996, Ser. No. 763,636
Int. Cl.[6] F23D *14/12;14/43*
U.S. Cl. 431—2 **12 Claims**



1. A process for directing a gaseous fuel flame, comprising the steps of:

a) providing a nozzle having a bore extending therethrough, the bore comprising a first end portion, a second end portion, and an arcuate middle portion defining an arcuate tube surface, wherein the arcuate tube surface comprises silicon carbide, and

b) introducing a flame having a temperature of between about 1800° C. and 1925° C. into the first end portion of the bore, the flame flowing towards the second end portion of the bore and impinging upon at least a portion of the arcuate tube surface comprising silicon carbide at a temperature of between about 1800° C. and 1925° C.

5,813,846

LOW NOX FLAT FLAME BURNER

John N. Newby, Lexington, Ky.; Robert A. Shannon, Avon Lake, and Keith J. Nieszczur, Seven Hills, both of Ohio, assignors to North American Manufacturing Company, Cleveland, Ohio

Filed Apr. 2, 1997, Ser. No. 832,570
Int. Cl.[6] F23M *3/00*
U.S. Cl. 431—9 **12 Claims**

1. A flat flame burner comprising:

a burner tile for reacting a combustible mixture to produce a flame, said burner tile having an outlet passage with a radially divergent surface;

means forming a first passage for admitting a primary reactant flow into the burner tile;

means forming a second passage including a primary injector, at a position upstream of the burner tile, for admitting a first flow of a secondary reactant into the primary reactant flow so as to create the combustible mixture;

means for rotating the flow of primary reactant within the first passage wherein the rotational flow cooperates with the divergent surface of the burner tile to produce a radially divergent

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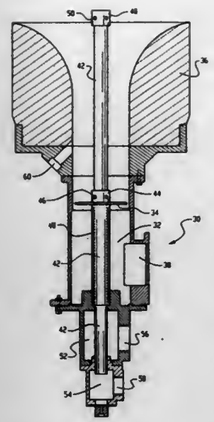


flame at the outlet, and wherein the rotational flow entrains inert gases from an environment ambient to the burner;

wherein said second passage also includes a secondary injector, substantially proximate to a downstream end of said outlet passage of said burner tile for admitting a second flow of secondary reactant radially into the entrained inert gases.

5,813,847

DEVICE AND METHOD FOR INJECTING FUELS INTO COMPRESSED GASEOUS MEDIA

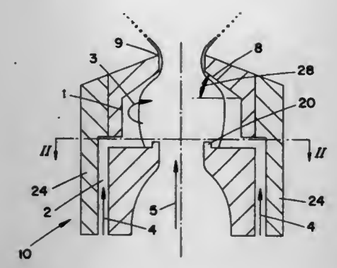
Adnan Eroglu, Untersiggenthal; Hans Peter Knöpfel, Besenbüren, both of Switzerland, and Peter Senior, Leicester, Great Britain, assignors to ABB Research Ltd., Zurich, Switzerland

Filed Aug. 2, 1996, Ser. No. 691,674

Claims priority, application Germany, Oct. 2, 1995, 195 36 837.1

Int. Cl.[6] F23C *5/00*

U.S. Cl. 431—8 **8 Claims**



1. A method for operating a fuel injector for atomization of the fuel, the fuel injector having a cylindrical hollow body having an outlet port, the outlet opening forming an atomization edge, the body defining an interior swirl chamber having an axial flow direction leading to the outlet port, the swirl chamber having a cone-shaped portion narrowing toward the outlet port, the body further defining an air duct with a mouth connecting to an upstream end of the swirl chamber, the body defining at least one fuel feed passage to guide fuel into the body and at least one inlet opening leading laterally from the at least one fuel feed passage to the swirl chamber downstream of the mouth, and the body having a dividing wall extending axially downstream from the mouth at least to a center of the at least one inlet opening, the method comprising the steps of:

feeding fuel through the inlet opening into the swirl chamber, wherein a swirling film flow of fuel is produced on a surface of the swirl chamber; and

introducing atomization air from the air duct into the swirl chamber;

wherein, the fuel film upon reaching the atomization edge is broken into droplets, and wherein the atomization air applies additional shear forces to the fuel film and assists the break-up of the fuel into droplets.

5,813,848

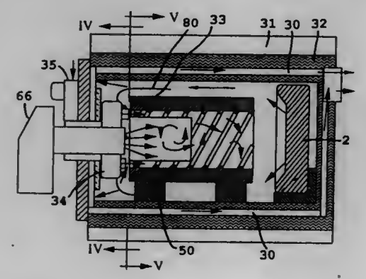
DEVICE FOR BOILERS

Kaj-Ragnar Loqvist, Regnbågsvägen 40, S-737 43 Fagersta, Sweden

Filed Sep. 19, 1996, Ser. No. 715,551

Int. Cl.[6] F23L *7/00*

U.S. Cl. 431—116 **12 Claims**



1. A boiler comprising:

a combustion chamber;

an arrangement to carry heat away from said combustion chamber;

a tube disposed in said combustion chamber;

said tube comprising a first end;

said tube comprising a second end;

a burner disposed to inject a flame into said first end of said tube;

said tube comprising a first portion disposed adjacent to said first end of said tube;

said tube comprising a second portion disposed adjacent said first portion of said tube and away from said first end of said tube;

said first portion of said tube having an interior cross section dimension;

said second portion of said tube having an interior cross section dimension;

said interior cross section dimension of said first portion being less that said interior cross section dimension of said second portion; and

said first portion of said tube comprising at least one channel configured to suck hot fumes from said combustion chamber, to further heat the hot fumes sucked from said combustion chamber, and to inject the further heated hot fumes into said second portion of said tube for further combustion upon said burner injecting a flame into said first end of said tube.

5,813,849

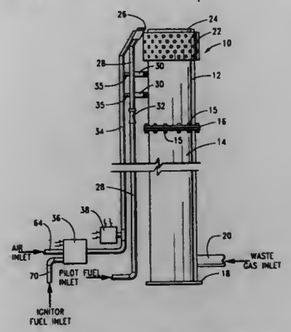
FLAME DETECTION APPARATUS AND METHODS

Robert E. Schwartz, and Lawrence D. Berg, both of Tulsa, Okla., assignors to John Zink Company, A Division of Koch-Glitsho, Inc., Tulsa, Okla.

Filed Aug. 7, 1996, Ser. No. 693,419

Int. Cl.[6] F23D *13/20*

U.S. Cl. 431—202 **22 Claims**



1. An improved flame detection apparatus for detecting the presence or non-presence of a flame issued from a pilot burner located at the top open discharge end of a flare stack comprising:

a conduit having an end positioned at said open discharge end of said flare stack relative to said flame whereby sound produced by said flame is conducted by said conduit to a location remote from said flame near the bottom of said flare stack;

a sound detector connected to said conduit at said location remote from said flame for detecting sound conducted by said conduit and for generating a signal representative of said sound; and

means for receiving said signal and for indicating the presence or non-presence of said flame in response thereto.

5,813,850

KEROSENE COMBUSTION APPARATUS

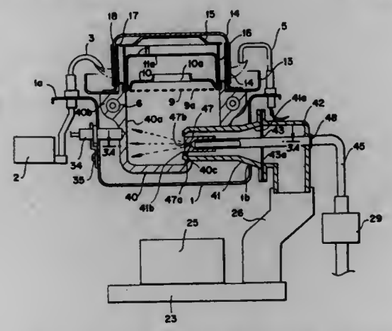
Kyoung-Sik Lee, 908, Maetan 1-Dong, Paldal-Gu, Suwon-City, Kyungki-Do, Rep. of Korea

Filed Oct. 9, 1996, Ser. No. 728,358

Claims priority, application Rep. of Korea, Oct. 11, 1995, 1995-34890

Int. Cl.[6] F23D *11/44*

U.S. Cl. 431—208 **5 Claims**



1. A kerosene vaporizing apparatus adapted for use in a kerosene combustion apparatus, the kerosene vaporizing apparatus comprising:

a burner body including an opening and a heated inner surface situated opposite the opening;

a venturi tube connected to the opening of the burner body for conducting combustion air toward the heated inner surface, the venturi tube having a longitudinal axis and a pair of tapered sections spaced longitudinally apart to cause a velocity of the combustion air to gradually increase toward an outlet of the venturi tube; and

a nozzle pipe extending through the venturi tube for conducting kerosene toward the heated inner surface for vaporizing the kerosene, the nozzle pipe including a nozzle cap mounted at a discharge end thereof, the nozzle cap having a kerosene passage including a first portion configured to induce a spiral turning of kerosene conducted therethrough, and a gradually expanding second portion defining a discharge end, the first portion including a downstream end coinciding with an upstream end of the second portion for producing a sudden reduction in speed and pressure of kerosene exiting the first portion.

5,813,851

HEAT TREATMENT METHOD

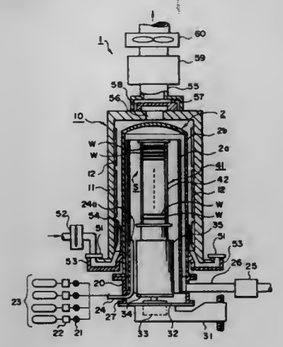
Ken Nakao, Sagamihara, Japan, assignor to Tokyo Electron, Ltd., Tokyo-to, Japan

Filed Sep. 5, 1996, Ser. No. 708,710

Claims priority, application Japan, Sep. 7, 1995, 7-256725

Int. Cl.[6] F27D *5/00*

U.S. Cl. 432—6 **3 Claims**



1. A method for applying a heat treatment to objects to be treated at a pressure, the method comprising the steps of:

(i) inserting objects to be treated placed on a susceptor into a reaction space constructed for applying a heat treatment thereto,

(ii) raising a temperature of said reaction space at a speed of 50° C./minute or more to heat said reaction space to a predetermined heat treatment temperature and heat treating the objects to be treated at a pressure of 10 Torr or more, and

(iii) heating the objects inserted into said reaction space at a predetermined heat treatment temperature for treatment by a processing gas under a pressure less than the pressure of step (ii).

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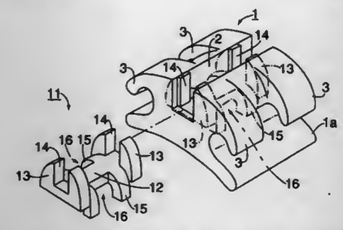
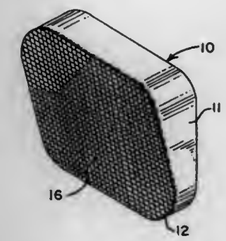
5,813,852
ORTHODONTIC BRACKET
Kozo Kawaguchi, Fukushima Ken, Japan, assignor to GAC International, Inc., Central Islip, N.Y.
Filed Jun. 2, 1995, Ser. No. 458,838
Claims priority, application Japan, Feb. 17, 1995, 7-052040
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—8 46 Claims



1. An orthodontic bracket for use in orthodontic treatment with an arch wire and an auxiliary orthodontic appliance, comprising:
a plastic bracket body including a slot therein; and
a reinforcement member embedded in said bracket body, said reinforcement member defining a wire retention slot located in said slot of said bracket body for receiving and engaging the arch wire, said reinforcement member also defining an auxiliary appliance slot configured for receiving and retaining the auxiliary appliance therein.

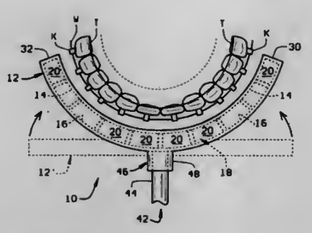
5,813,853
TORQUE/ROTATION BASE FOR ORTHODONTIC ATTACHMENT AND METHOD OF MAKING SAME
Peter C. Kesling, 611 W. 250 South, LaPorte, Ind. 46350
Filed Mar. 26, 1996, Ser. No. 624,716
Int. Cl.[6] A61C *7/00*
U.S. Cl. 433—9 8 Claims



1. The method of making a substantially rectangular pad for an orthodontic attachment from a strip of plate/mesh material having a thickness varying between two opposing edges, said method comprising the steps of: deforming a strip of plate/mesh material so that it will have a varying thickness, and stamping substantially rectangularly shaped pads therefrom.

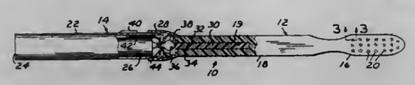
5,813,854
ORTHODONTIC BRACE INSTALLATION DEVICE
Stephen G. Nikodem, 4110 Von Talge, St. Louis, Mo. 63128
Filed Apr. 7, 1997, Ser. No. 834,954
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—29 21 Claims

1. A device for use in performing an orthodontic process in which light supplied from a light source through a light transmissive cable is directed at a patient's teeth comprising:



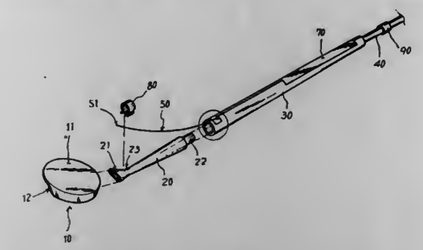
a support deformable to conform to an arch shape of a set of the patient's teeth, the support having a length at least corresponding to the arcuate length of the set of teeth, said support comprising a housing formed of a flexible material which retains its shape once the housing is deformed to conform to the arch shape of said set of teeth;
attachment means attaching the support to an end of the cable for light transmitted through the cable to be directed into the support; and,
light diffusion means diffusing light directed into the support throughout the support, for diffused light to be directed from the device simultaneously at all of the patient's teeth on which the orthodontic process is being pre-formed to substantially reduce the amount of time required for light to be used in performing the process.

5,813,855
ILLUMINATED TOOTHBRUSH
Raymond A. Crisio, Jr., 4 S. Church St., Belleville, Ill. 62220
Filed Sep. 23, 1997, Ser. No. 935,558
Int. Cl.[6] A61C *1/00*
U.S. Cl. 433—29 2 Claims



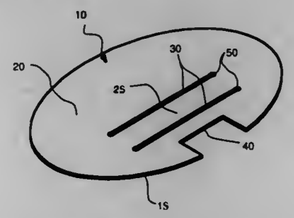
1. An illuminated toothbrush, comprising;
a toothbrush having a body including a head portion and a handle portion,
said handle portion having an axial longitudinally extending socket in its end portion opposite the head portion;
a plurality of rows of toothbrush bristle tufts cooperatively projecting laterally from said head portion,
each of said tufts comprising a plurality of plastic filaments of uniform length and diameter and having an exterior surface provided with light ray admitting areas substantially medially the ends thereof,
said plastic filaments being doubled back upon themselves and embedded in said head portion;
light producing means including a light bulb and a reflector;
a cap shielding said light bulb;
light conducting shaft means axially connected at one end portion with said cap for receiving light rays from said lamp and disposed at its other end portion within said handle socket; and,
energizing means including a source of electrical energy for energizing said bulb,
whereby light is transmitted by said shaft means and said toothbrush body into said brush bristles for illuminating the ends of the respective plastic filaments.

5,813,856
DENTAL SUCTION MIRROR
Wangkun Lee, Kuk-dong Apt. 101-1802, Hakjang-dong, Sasang-ku, Pusan, Rep. of Korea
Filed Jan. 31, 1997, Ser. No. 792,490
Int. Cl.[6] A61C *1/00*
U.S. Cl. 433—31 2 Claims



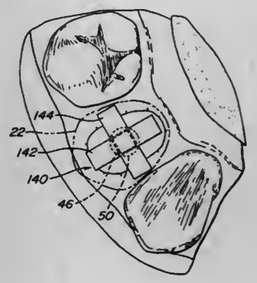
1. A dental suction mirror comprising:
a stainless reflecting plate having a slant depression in a front portion thereof, an oblong groove in a rear portion thereof and three holes having different paths in the inner center and on both sides of the plate, the holes connecting the oblong groove to the slant depression;
a stainless connection tube having an expanding front portion connected into the oblong groove and a projecting rear tube; and
a handle tube having an insertion groove along an upper part thereof for receiving an optical fiber, the handle tube being connected to the rear tube of the stainless connection tube, an optical fiber in the insertion groove, stickers applied over to the insertion groove to retain the optical fiber over a polished specular surface of the plate; and
the stainless reflecting plate, the stainless connection tube and handle the tube being coated with nickel-chrome and additionally SiO_2.

5,813,857
TONGUE DEFLECTOR FOR USE WITH SALIVA EJECTORS
Reuben Hertz, 2318 Sea Island Dr., Ft. Lauderdale, Fla. 33301
Filed Jul. 17, 1996, Ser. No. 682,320
Int. Cl.[6] A61C *17/10*
U.S. Cl. 433—93 7 Claims



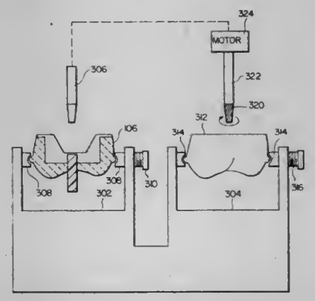
1. A protective tongue deflector for use with a saliva ejector comprising:
a flat body of flexible material of sufficient height to extend from the floor of the mouth to the teeth, and;
a plurality of slits extending through the body;
wherein the slits are parallel to one another to form a strap therebetween;
whereby the tongue deflector may be mounted onto a stem of the saliva ejector by pushing or pulling the strap away from the flat body to form a separation between the body and the strap which receives the saliva ejector stem.

5,813,858
HEALING CAP SYSTEM WITH IMPLANT ALIGNMENT INDICATOR
Gary Singer, Middletown Media, Pa., assignor to Phillip Singer; Michael Ginn, and Neil Gottehrer
Division of Ser. No. 216,908, Mar. 23, 1994, Pat. No. 5,492,421. This application Nov. 3, 1995, Ser. No. 552,668
Int. Cl.[6] A61C *8/00;3/00*
U.S. Cl. 433—173 2 Claims



1. An apparatus for observing the orientation of a dental implant, having an anti-rotational coupling, in a patient's mouth, said apparatus comprising an alignment indicator having a shaft having a proximal end and a distal end, said distal end having an anti-rotational coupling to matingly engage the anti-rotational coupling of the dental implant, said proximal end of said indicator having two members mutually perpendicular to said shaft and to each other.

5,813,859
METHOD AND APPARATUS FOR TOOTH RESTORATION
Victor J. Hajjar, 4940 Linglestown Rd., Harrisburg, Pa. 17112, and John Robert Studer, 135 Grandview Rd., Hummelstown, Pa. 17036
Filed Jan. 23, 1997, Ser. No. 785,316
Int. Cl.[6] A61C *5/10*
U.S. Cl. 433—223 20 Claims



1. Method for producing a dental prosthetic comprising the steps:
providing a prosthetic model;
providing a prosthetic blank having exterior dimensions matched to those of said prosthetic model;
forming an interior of said prosthetic model as a template; and
matching an interior of said prosthetic blank to said prosthetic model.

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5,813,860

Patent Not Issued For This Number

5,813,861

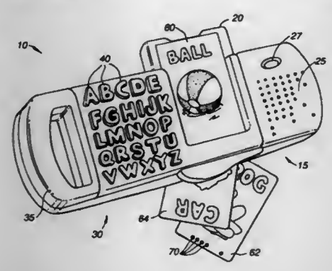
TALKING PHONICS INTERACTIVE LEARNING DEVICE

Michael Carleton Wood, Berkeley, Calif., assignor to Knowledge Kids Enterprises, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 200,609, Feb. 23, 1994, Pat. No. 5,511,980, and a continuation of Ser. No. 382,331, Feb. 1, 1995, abandoned. This application Jun. 20, 1997, Ser. No. 880,141

Int. Cl.[6] G09B *5/00*

U.S. Cl. 434—169 **29 Claims**



1. A method of interactive learning comprising the steps of:

providing an interactive learning device having a plurality of letter-shaped keys, a card receiving portion, and a speech processor coupled to said keys, such that at least one phoneme is associated with each key;

providing a plurality of cards receivable by said card receiving portion and identifiable by the speech processor each card defining at least one predetermined sequence of letters representing a word;

placing at least one of said cards in said card receiving portion; and

selecting said keys when said card is received by said interactive learning device, to cause said speech processor to compare said selected keys to said predetermined sequence, and if said selected keys are selected in correct order to spell the represented word, to recite a position-dependent phoneme associated with a selected key, or if said selected keys are not selected in the correct order, to recite a name of the letter of the key.

3. A teaching device, comprising:

(a) a sequential arrangement of selectable indicia representing a plurality of language symbols spelling a word, each language symbol having at least one phoneme associated therewith; and

(b) an output, configured to compare a selected indicium to a predetermined sequence of indicia associated with the sequential arrangement and, if the selected indicium is selected in the sequence of the arrangement, to produce an output signal representative of a phoneme associated with the selected indicium, wherein the signal produced represents the phoneme associated with the language symbol as determined by a position of the selected indicium in the predetermined sequence or, if the selected indicium is not selected in the sequence of the arrangement, to produce an output signal representative of the name of the language symbol.

5,813,862

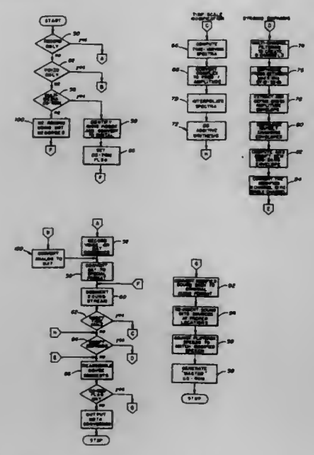
METHOD AND DEVICE FOR ENHANCING THE RECOGNITION OF SPEECH AMONG SPEECH-IMPAIRED INDIVIDUALS

Michael Mathias Merzenich, San Francisco; William Michael Jenkins; Christoph E. Schreiner, both of Pacifica, all of Calif.; Paula Anne Tallal, Lumberville, Pa., and Steven Lamont Miller, Denville, N.J., assignors to The Regents of the University of California, San Francisco, Calif., and Rutgers, The State University of New Jersey, New Brunswick, N.J.

Continuation of Ser. No. 351,803, Dec. 8, 1994, abandoned. This application May 20, 1997, Ser. No. 858,961

Int. Cl.[6] G09B *9/00;23/00*

U.S. Cl. 434—185 **29 Claims**



1. A method of teaching temporally impaired individuals to discriminate between the stimuli of at least two rapidly changing frequencies of consonant sounds, the method comprising the steps of:

a) separating the at least two differing sound stimuli to provide an interstimulus interval of at least 100 milliseconds;

b) prolonging the consonant sound in each of the stimuli by a factor of at least thirty percent;

c) repeating the at least two differing stimuli in random order until the temporally impaired individual is able to distinguish the order of each stimulus;

d) decreasing the interstimulus interval by at least a one percent factor;

e) repeating step c) with a decreased interstimulus interval until the temporally impaired individual is able to distinguish the order of each stimulus; and,

f) repeating steps c) through e).

23. A method of teaching an individual to discriminate between at least two sound stimuli, the method comprising:

a) providing at least two sound stimuli which include a consonant sound stimulus and a vowel sound stimulus;

b) prolonging at least one of the sound stimuli;

c) repeating the at least two sound stimuli until the individual is able to distinguish the characteristics of each stimulus;

d) decreasing the length of the prolonged sound stimulus; and

e) repeating step c) with a decreased length of prolonged sound stimulus until the individual is able to distinguish the characteristics of the at least two sound stimuli

f) repeating steps c) through e).

26. A method of teaching an individual to discriminate between the characteristics of a sound stimulus, the method comprising:

a) providing a sound stimulus containing a portion having a rapid temporal change in frequency content;

b) emphasizing the energy level of the portion of the sound stimulus that contains the rapid temporal change in frequency content;

c) repeating the sound stimulus until the individual is able to distinguish the characteristics of the sound stimulus;

d) reducing the emphasis of the energy level of the portion of the sound stimulus that contains the rapid temporal change in frequency content;

e) repeating step c) until the individual is able to discriminate between the characteristics of a sound stimulus

f) repeating steps c) through e).

5,813,863

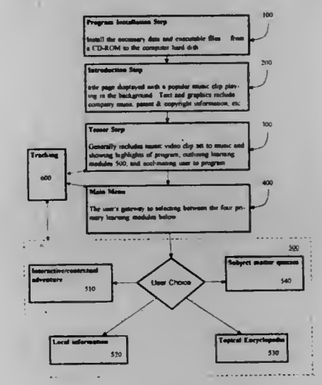
INTERACTIVE BEHAVIOR MODIFICATION SYSTEM

Sharon R. Sloane, 4636 Cherry Valley Dr., Rockville, Md. 20853, and Jeffrey R. Hall, 10912 Orleans Way, Kensington, Md. 20895

Filed May 1, 1996, Ser. No. 637,970

Int. Cl.[6] G09B *19/00;7/00*

U.S. Cl. 434—236 **12 Claims**



1. A multimedia method for interactive behavior modification for promoting awareness of and changing high-risk behaviors, said method being administered by means of a computer system with full-motion video and audio output capabilities, the method comprising:

teaser step including teaser video/audio for attracting a user to use the system, showing highlights, and familiarizing said user with primary subject matter;

a main menu step providing a gateway to said user for executing one from among a group of primary learning modules;

a group of primary learning modules, said group at least including,

an interactive adventure module comprising a user-navigable decision tree in which the user is required to make decisions of consequence to their health, said decisions being presented in real-time in the context of a first hand virtual experience in a familiar social setting as portrayed by video/audio clips, wherein the user is confronted with decisions while navigating said interactive contextual adventure module,

a local information module comprising a user-navigable database of local information relating to subject matter concerns and resources in an immediate geographic region of the user,

a topical encyclopedia module including a user-navigable database of frequently requested subjects and information thereon, and video/audio/images for accentuating said information,

a subject matter quizzes module including a series of culturally and geographically relevant questions about the primary subject matter presented with accompanying video/audio/images; and

a tracking module for tracking user information and decisions, said tracking module further comprising global tracking means operating to record and compile information on multiple user patterns for indicating where education or public health intervention may be needed, and local tracking means operating to record and compile a single user's inputs and to foreclose subsequent decisions in said interactive adventure module in accordance with said user inputs to simulate impaired judgment.

5,813,864

SIMULATOR

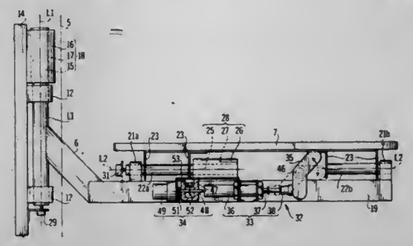
Junichi Ikuta, Tokyo, Japan, assignor to Namco Limited, Tokyo, Japan

Filed May 17, 1996, Ser. No. 648,981

Claims priority, application Japan, Nov. 30, 1995, 7-336173

Int. Cl.[6] A63B *22/16*

U.S. Cl. 434—253 **19 Claims**



1. A simulator for presenting a simulation movement on presentation means correspondingly to a movement of an operator, comprising:

an arm member being reciprocally turnable about a first axis line;

a support plate for supporting the operator, the support plate being supported by said arm member and tiltable about a second axis line extending in a direction crossing the first axis line;

first reactive force applying means for holding said arm member in a free state in a neutral position with respect to the first axis line and for applying a reactive force to said arm member when said arm member is turned to a direction in which said arm member deviates from the neutral position;

second reactive force applying means for holding said support plate in a free state in a neutral position with respect to the second axis line and for applying a reactive force to said support plate when said support plate is tilted to a direction in which said support plate deviates from the neutral position, the second reactive force applying means being supported by said arm member; and

control means for controlling the simulation movement on said presentation means correspondingly to a movement of said support plate about the first and second axis lines.

5,813,865

METHODS AND APPARATUS FOR TEACHING SCIENCE AND ENGINEERING

Thomas J. Greenbowe, Ames, and Michelle A. McPhillen, Nevada, both of Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Jun. 23, 1993, Ser. No. 81,561

Int. Cl.[6] G09B *23/00*

U.S. Cl. 434—276 **40 Claims**

1. An apparatus for teaching science and engineering to a user, the apparatus comprising:

a means for displaying imagery;

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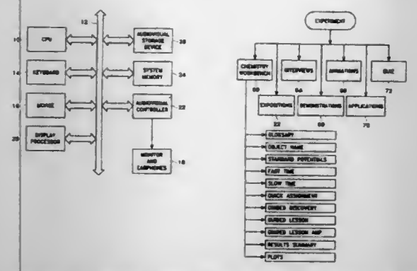
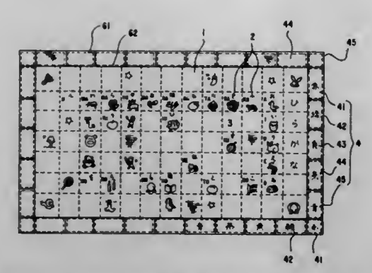




a means for causing a plurality of objects to be pictured on the display means, the objects being apparatus, equipment, devices, materials, and supplies used in science and engineering;

a means by which the user can assemble a plurality of the objects pictured on the display means into an operating pictorial representation of an operating experimental configuration, the experimental configuration being characterized by a relationship among a plurality of experimental parameters;

a means by which the user can simulate the performance of an experiment using the pictorial representation of the experimental configuration, an experiment being a method of measuring one of the plurality of experimental parameters by means of the experimental configuration, the operation of the pictorial representation of the experimental configuration being governed by the same relationship among the experimental parameters that characterizes the operation of the experimental configuration.

26. A method for teaching science and engineering to a student, the method comprising the steps:

providing a means for displaying imagery;

causing a plurality of objects to be pictured on the display means, the objects being apparatus, equipment, devices, materials, and supplies used in science and engineering;

enabling the student to assemble a plurality of the objects pictured on the display means into an operating pictorial representation of an operating experimental configuration, the experimental configuration being characterized by a relationship among a plurality of experimental parameters;

enabling the student to simulate the performance of an experiment using the pictorial representation of the experimental configuration, an experiment being a method of measuring one of the plurality of experimental parameters by means of the experimental configuration, the operation of the pictorial representation of the experimental configuration being governed by the same relationship among the experimental parameters that characterizes the operation of the experimental configuration.

5,813,866

CLOTH CHART FOR LEARNING CHARACTERS

Takashi Maeda, Okinawa-ken, Japan, assignor to Rabbit Co., Ltd., Naha, Japan

Filed Mar. 5, 1997, Ser. No. 812,391

Claims priority, application Japan, Mar. 5, 1996, 8-002362 U

Int. Cl.[6] G09B *29/00*

U.S. Cl. 434—430 **2 Claims**

1. A cloth chart for learning characters comprising a cloth comprising at least one sheet of cloth in piles, characters indicating portions indicated on at least one face of the cloth where a plurality of characters for learning are arranged, picture indicating portions where one of a plurality of pictures is respectively located adjacent each of the characters so that a pronunciation of a first letter in a title of said one picture corresponds to a reading of the character, at least one of said character indicating portions and said picture indicating portions being embroidered on said at least one sheet, a plurality of pieces of and various kinds of cloth in color connected in continuous manner along a circumference of said at least one face of the cloth, and a portion for horizontally inserting a rod formed on the upper side of a face opposite said at least one face of the cloth.

5,813,867

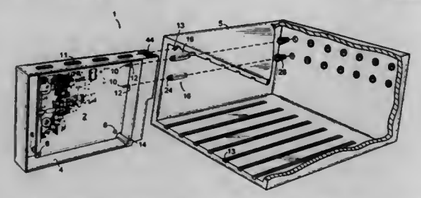
RF CONNECTOR WITH QUICK DISCONNECT

Ronald L. Hodge, Flowery Branch, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Nov. 27, 1996, Ser. No. 757,225

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—63 **25 Claims**



1. A connector assembly for electrically coupling an external circuit to a printed circuit board comprising, in combination:

a housing having an end wall;

a bore formed in the end wall;

a circuit board, having an electroconductive circuit portion, secured to the housing; and

a connector having a body portion, a first ends an opposed second end, and an electrode extending from the first end, the first end and the electrode extending through the bore, and the first end secured to the end wall,

wherein the electrode is proximate the circuit portion when the first end and the electrode extend through the bore.

5,813,868

ELECTRICAL CONTACT SPRING ARM POSITIONING ARRANGEMENT

Ward E. Strang, Fairfield; Carol Z. Howard, Oxford, and Thomas M. McDonald, Monroe, all of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Jan. 24, 1997, Ser. No. 788,137

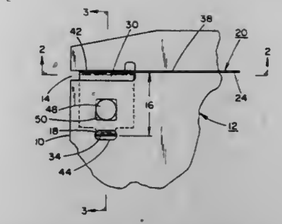
Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—82 **9 Claims**

1. An electrical contact spring arm structure adapted to be mounted on a circuit board having first and second slots extending therethrough at predetermined spacings relative to each other, said spring arm structure comprising:

(a) a planar element having a first upstanding flat element adapted to extend upwardly through said first slot to form a spring arm;

(b) a flange element at a lower end of said first flat element extending below said circuit board at an angle relative to the



plane of said first upstanding flat element, and an upwardly curving tab member on an edge of said flange element opposite said first portion in parallel spaced relationship therewith extending into said second slot.

5,813,869

IC SOCKET AND GUIDE MEMBER

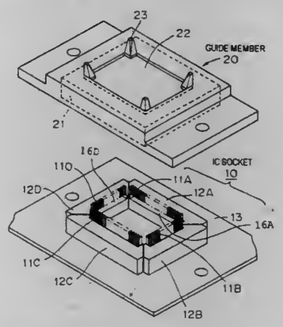
Shigeru Matsumura, Ohsato-gun, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Nov. 18, 1996, Ser. No. 751,330

Claims priority, application Japan, Nov. 20, 1995, 7-301402

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—72 **2 Claims**



1. An apparatus comprising:

an IC socket having contacts brought into contact with leads projecting from four sides of a package of a surface-mounted type IC, and comprising:

four insulation blocks separately supporting respective groups of contacts to be contacted with the leads on the respective sides of said surface-mounted type IC, said four insulation blocks assembled together to define a generally quadrilateral framing, each of said four insulation blocks having a generally isosceles trapezoidal shape in plan view and having positioning lug means formed on the bottom surface thereof, each of said groups of contacts being arrayed on the corresponding insulation block along the minor side of the trapezoid with a predetermined pitch, and

an insulation substrate mounting thereon said four insulation blocks at predetermined positions so as to define a generally quadrilateral framing; and

a guide member fitting over said IC socket and being a monolithic part molded from insulating resinous material comprising a plate-like insulation element having a generally quadrilateral recess extending inwardly from the bottom thereof and receiving the four insulation blocks in the form of a framing mounted to the insulation substrate of said IC socket, a generally quadrilateral opening formed through the recess and exposing at least the top portions of the contact arrays supported in electrical insulation by said insulation blocks, and guide posts formed at four corners of the opening and extending upwardly therefrom and defining the position of an IC being placed onto said IC socket.

5,813,870

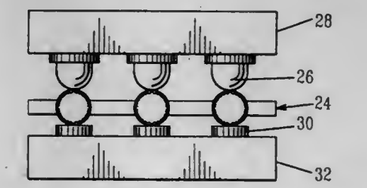
SELECTIVELY FILLED ADHESIVES FOR SEMICONDUCTOR CHIP INTERCONNECTION AND ENCAPSULATION

Michael Anthony Gaynes, Vestal, N.Y.; Jaynal Abedin Molla, Chandler, Ariz.; Steven Paul Ostrander, Scotai, N.Y.; Judith Marie Roldan, Ossining, N.Y.; George John Saxenmeyer, Apalachin, N.Y., and George Frederick Walker, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1996, Ser. No. 678,852

Int. Cl.[6] H01R *4/58*

U.S. Cl. 439—91 **22 Claims**



1. An interconnection and encapsulation structure comprising:

a dielectric adhesive film having opposed first and second surfaces and a plurality of through-holes extending from said first surface to said second surface;

each of said through-holes being filled with a cluster or electrically conductive filaments which are substantially dendritic in form extending beyond said first and second surfaces.

5,813,871

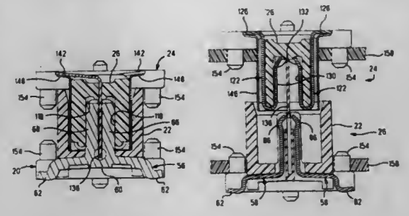
HIGH FREQUENCY ELECTRICAL CONNECTOR

Dimitry Grabbe, Middletown, and Iosif Korsunsky, Harrisburg, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jul. 31, 1996, Ser. No. 690,130

Int. Cl.[6] H01R *4/66*

U.S. Cl. 439—108 **32 Claims**



1. An electrical connector for interconnecting first and second electrical circuits on first and second circuit boards, respectively, said electrical circuits having both ground pads and signal pads, comprising:

(a) an electrically insulating elongated housing having a length and first and second matable housing parts with first and second longitudinal axes, respectively, said first housing part having first, second, and third openings therein extending parallel to said first axis for a major portion of said length,

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said first and third openings having contact receiving walls on opposite sides of and adjacent said second opening;

(b) a plurality of electrical contact pairs in said housing, each contact pair including first and second matable contacts having a lead extending from each said contact, each of said first contacts being in said first housing part and said lead thereof adapted for electrical engagement with said first circuit, and each of said second contacts being in said second housing part and said lead thereof adapted for electrical engagement with said second circuit, some of said first contacts being spaced along said contact receiving wall of said first opening and others of said first contacts being spaced along said contact receiving wall of said third opening;

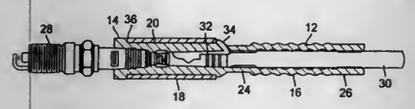
(c) an elongated electrically conductive ground plate disposed between rows of said second contacts in said second housing and extending into said second opening of said first housing; and

(d) a plurality of electrically conductive shield plates disposed in said first housing in electrical engagement with said elongated ground plate, said shield plate being disposed between each adjacent pair of said first contacts.

5,813,872
AUTOMOTIVE SPARK PLUG COVER

Chris Howard Evans, Dumas; Fredric Jay Anderson, Monticello; Gary Eugene Brown, Dumas; Rodney Lud Bevill, Monticello; James Thomas Ducote, Dumas, and James Richard Giannone, Monticello, all of Ark., assignors to Cooper Technologies Company, Houston, Tex.

Filed Mar. 6, 1996, Ser. No. 611,519
Int. Cl.[6] H01R *13/44*
U.S. Cl. 439—125 **15 Claims**



1. A spark plug cover, comprising:

an elastomeric boot including a first portion for covering a spark plug terminal area and a second portion for covering a lead wire, the elastomeric boot extending from the first portion to the second portion; and

a ceramic insulating shield covering a part of said elastomeric boot.

5,813,873
ELECTRICAL OUTLET SAFETY COVER

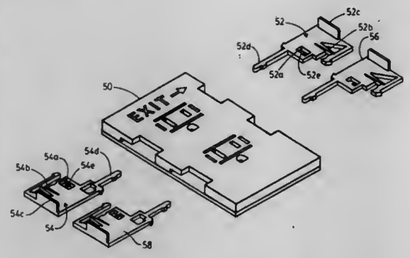
Theodore McBain, 515 Nightingale Rd., Tahoe City, Calif. 96145; and Melvin R. Osborn, 268 Park, Brockway Vista, Calif. 96145

Filed Sep. 6, 1996, Ser. No. 708,344
Int. Cl.[6] H01R *13/44*
U.S. Cl. 439—145 **16 Claims**

1. An apparatus comprising:

an outlet cover frame;

two plates operably connected to the cover frame, each plates having an aperture that allows a power prong of a plug to be placed into the outlet when the plates are aligned in an open position, each plate also having an elongated portion that is adapted to contact the other plate so that in a closed position the plates bias each other such that a portion of the plates blocks access to the outlet, wherein the plates can be pushed in toward one another to an open position to allow a plug to

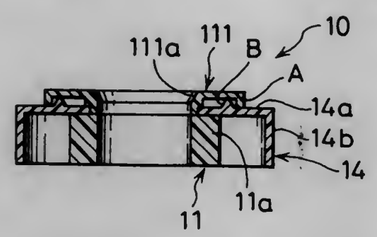


be placed in the outlet, wherein the plates have a locking pin which is adapted to fit into a hole base of a prong.

5,813,874
RELAY APPARATUS FOR RELATIVELY ROTATABLE MEMBERS

Hidehiro Ichikawa; Hiraku Tanaka, and Akihisa Kawamura, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 13, 1996, Ser. No. 747,608
Claims priority, application Japan, Nov. 20, 1995, 7-301472
Int. Cl.[6] H01R *35/04*
U.S. Cl. 439—164 **2 Claims**



1. A relay apparatus for relatively rotatable members, said relay apparatus comprising:

a first rotator having an inner cylindrical portion;

a second rotator having an outer cylindrical portion surrounding said inner cylindrical portion with a predetermined space interval, and being rotatable relative to said inner cylindrical portion;

a flexible flat cable coiled inside a circular space between said inner cylindrical portion and said outer cylindrical portion;

an upper cover having an aperture at a center portion thereof, said upper cover placed over said outer cylindrical portion in order to cover an upper side of said circular space; and

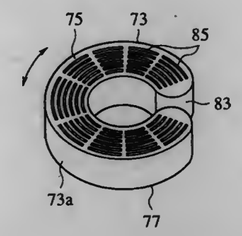
an outer leading cover rotatably arranged on said upper cover, said outer leading cover having a diameter smaller than a diameter of said upper cover and being coupled to said first rotator through said aperture for leading said flexible flat cable outward,

said outer leading cover having a first circular rib formed along an outer circumference thereof, said first circular rib being in contact with said upper cover.

5,813,875
ELECTRICAL CONNECTION BETWEEN STEERING WHEEL AND STEERING COLUMN

Satoshi Ishikawa; Hidehiro Ichikawa; Nobuyuki Tsujino, and Hiroaki Iizuka, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 568,430, Dec. 6, 1995, abandoned.
This application Jun. 11, 1997, Ser. No. 873,287
Claims priority, application Japan, Dec. 14, 1994, 6-310646; Jul. 27, 1995, 7-191763
Int. Cl.[6] H01R *35/04*
U.S. Cl. 439—164 **2 Claims**



1. An electrical connecting device provided between a steering wheel and a steering column to establish an electric connection therebetween, comprising:

a stationary body fixedly secured to the steering column;

a rotatable body positioned to define a circular space with respect to said stationary body;

a flexible flat cable located in said circular space, one end of said flexible flat cable being fixedly secured to said rotatable body and the other end thereof being fixedly secured to said stationary body so that said flat cable provides an electrical communication between said rotatable body and said stationary body; and

a movable body placed in said circular space and having an insertion section through which said flat cable passes, said movable body having a sliding surface slidable on a slide contact surface within said circular space and extending in a rotational direction of said rotatable body, and said flat cable reversely turning halfway at said insertion section of said movable body so that its winding direction inside of said movably body is opposite to that outside thereof and movable to follow rotation of said rotatable body relative to the stationary body in forward and reverse directions,

wherein at least one of said slide contact surface within said circular space and the sliding surface of said movable body coming into contact with said slide contact surface, has a groove section having alternating grooves and flat portions extending in a circumferential direction to reduce sliding resistance to said movable body, said groove section being formed substantially over the whole of at least one of said slide contact surface and said sliding surface, and being divided circumferentially into a plurality of segments.

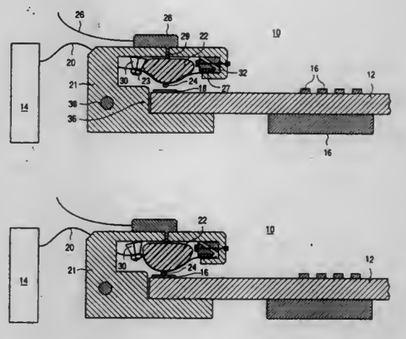
5,813,876
PRESSURE ACTUATED ZERO INSERTION FORCE CIRCUIT BOARD EDGE CONNECTOR SOCKET

Michael L. Rutigliano, Chandler, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 13, 1996, Ser. No. 662,887
Int. Cl.[6] H01R *13/15*
U.S. Cl. 439—260 **4 Claims**

1. An electrical connector for a circuit board having a plurality of electrical contacts, said connector comprising:

a flexible circuit having a first side and an opposite second side, said flexible circuit having a plurality of electrically conductive bumps protruding from said first side, said flexible circuit



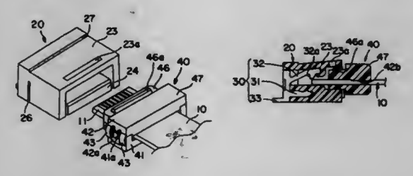
being secured at a first point and a second point, said first point being fixed, said second point pivoting about an axis of rotation; and

means for applying a force to said second side of said flexible circuit to physically engage said bumps of said flexible circuit with said contacts of said circuit board, said flexible circuit pivoting about said axis of rotation during said engagement such that said bumps mechanically scrub said contacts of said circuit board.

5,813,877
CONNECTOR FOR FLEXIBLE CIRCUIT BOARDS

Hideto Nakamura, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Feb. 21, 1997, Ser. No. 803,615
Claims priority, application Japan, Feb. 23, 1996, 8-036401
Int. Cl.[6] H01R *11/22*
U.S. Cl. 439—267 **13 Claims**



1. A connector for a printed circuit board comprising

a connector housing having a front, a back wall, a bottom wall, and an upper wall defining a hollow, a plurality of slits in said back wall, a terminal in each of said slits and including at least one pressing piece having a flexed position, wherein said terminal is spaced apart from said circuit board in a direction normal thereto, thereby forming a gap which is greater than a thickness of said circuit board, and a rest position, wherein said gap is not greater than said thickness and said pressure piece is in electrical contact with said circuit board,

a retainer comprising a cavity adapted to receive a portion of said circuit board, and a connecting member, adapted to enter said hollow and urge said terminal into said flexed position before said circuit board enters said gap,

said retainer further comprising a cover with depending sides, a main casing adapted to receive said cover, a window in a surface of said main casing, a pressing portion on said cover and corresponding to said window whereby, when said cover is placed on said main casing, said pressing portion bears against said circuit board in said cavity and fixes it in said main casing.

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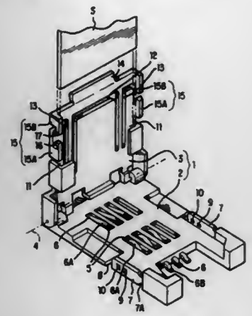
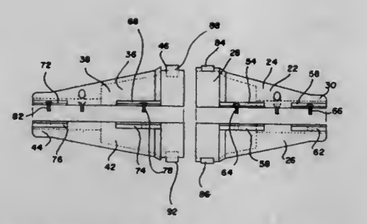
5,813,878
SURFACE CONTACT CARD CONNECTOR
Tomonari Kuwata, and Mitsuo Ishida, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1996, Ser. No. 770,149
Claims priority, application Japan, Dec. 28, 1995, 7-352213
Int. Cl.[6] H01R *13/04*
U.S. Cl. 439—326 **4 Claims**



1. A surface contact card connector comprising:
a base section made of an insulating material;
a cover section attached to said base section at a rear end for rotation between open and close positions;
a contact element provided on said base section such that a contact portion of said contact element is brought into contact with a surface contact card when said cover section is closed to said base section;
base and cover engaging side walls provided on opposite sides of both said base and cover sections, respectively, such that when said cover section is closed to said base section, said base and cover engaging side walls are spaced and faced respectively to each other;
at least said base or cover engaging side walls of said base or cover section being cantilevered arms and flexible;
engaging windows having through openings provided in said base or cover engaging side walls of said base or cover section;
engaging and releasing projections provided on said cover or base engaging side walls such that when said cover section is closed to said base section, said engaging and releasing projections flex said cantilevered arms of said base or cover section outwardly and engage with said engaging windows;
said engaging projections each having a substantially right-angled triangle shape whose upper side is substantially at right angles to said cover engaging side walls and said releasing projections each having a triangular shape and are provided at positions where portions of said cover engaging side walls with said releasing projections are more flexible than portions of said cover engaging side walls with said engaging projections when said cover section is opened from said base section.

5,813,879
ELECTRIC CORD ACCESSORY
Danilo Russo, 30 Duanest, Farmingdale, N.Y. 11735
Filed Aug. 22, 1997, Ser. No. 916,314
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—367 **5 Claims**

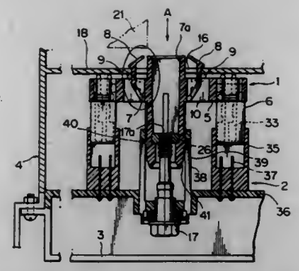
1. An electrical plug accessory which prevents the male and female portions of an electric cord from becoming disengaged, the accessory comprising in combination:
a female housing assembly comprising an upper half and a lower half, each half having a rearward extent, a forward extent, a first side edge, a second side edge, an exterior surface and an



interior surface, each half being tapered from the forward toward the rearward extent;
a male housing assembly comprising an upper half and a lower half, each half having a rearward extent, a forward extent, a first side edge, a second side edge, an exterior surface and an interior surface, each half being tapered from the forward toward the rearward extent;
an upper pair of primary arcuate flanges secured to opposite sides of the upper half of the female housing at the forward extent, an upper pair of secondary arcuate flanges secured to the opposite sides of the upper half of the female housing at the rearward extent;
a lower pair of primary arcuate flanges secured to opposite sides of the lower half of the female housing at the forward extent, a lower pair of secondary arcuate flanges secured to the opposite sides of the lower half of the female housing at the rearward extent;
screws securing the pair of upper primary flanges of the female housing to the pair of lower primary flanges of the female housing, and screws securing the pair of upper secondary flanges of the female housing to the pair of lower secondary flanges of the female housing;
an upper pair of primary arcuate flanges secured to opposite sides of the upper half of the male housing at the forward extent, an upper pair of secondary arcuate flanges secured to the opposite sides of the upper half of the male housing at the rearward extent;
a lower pair of primary arcuate flanges secured to opposite sides of the lower half of the male housing at the forward extent, a lower pair of secondary arcuate flanges secured to the opposite sides of the lower half of the male housing at the rearward extent;
screws securing the pair of upper primary flanges of the male housing to the pair of lower primary flanges of the male housing, and screws securing the pair of upper secondary flanges of the male housing to the pair of lower secondary flanges of the male housing;
an upper receptacle secured to the upper half of the female housing at the forward extent, a lower receptacle secured to the lower half of the female housing at the forward extent;
an upper protrusion secured to the upper half of the male housing at the forward extent, a lower protrusion secured to the lower half of the male housing at the forward extent.

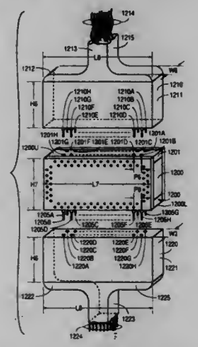
5,813,880
MOVABLE CONNECTOR
Shinji Kodama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Sep. 26, 1997, Ser. No. 938,607
Claims priority, application Japan, Sep. 30, 1996, 8-259336
Int. Cl.[6] H01R *13/627*
U.S. Cl. 439—364 **12 Claims**

1. A movable connector comprising:
a frame for holding a connector portion;
a nut provided on a tubular wall of said frame, with which a bolt provided on a mating fixed connector is engageable;
a primary resilient arm provided on said frame and provisionally engaged with a panel-opening, said primary resilient arm being disengaged from a panel portion by tightening said bolt; and



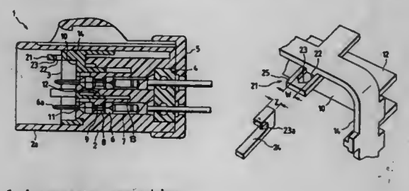
wherein said primary resilient arm is provided on said tubular wall, and a flexure-fulcrum of said primary resilient arm is located on a side of said fixed connector and a free end portion of said primary resilient arm is located on a side of said panel portion farther from the fixed connector than said flexure-fulcrum.

5,813,881
PROGRAMMABLE CABLE AND CABLE ADAPTER USING FUSES AND ANTIFUSES
Richard J. Nathan, Morgan Hill; James J. D. Lan, Fremont, and Steve S. Chiang, Saratoga, all of Calif., assignors to Prolinx Labs Corporation, San Jose, Calif.
Continuation-in-part of Ser. No. 194,110, Feb. 8, 1994, abandoned. This application Oct. 7, 1994, Ser. No. 320,086
Int. Cl.[6] H01R *29/00*
U.S. Cl. 439—516 **29 Claims**



1. A cable adapter for coupling a plurality of first terminals of a first cable connector to a plurality of second terminals of a second cable connector, said cable adapter comprising:
a first exposed surface;
a plurality of first cable contacts arranged in a first configuration suitable for coupling to said plurality of first terminals of said first cable connector, said plurality of first cable contacts being formed on said first exposed surface;
a second exposed surface;
a plurality of second cable contacts arranged in a second configuration suitable for coupling to said plurality of second terminals of said second cable connector, said plurality of second cable contacts being formed on said second exposed surface;
a plurality of first traces, each first trace being insulated from another first trace, each first trace being coupled to a first cable contact;
a plurality of second traces, each second trace being insulated from another second trace, each second trace being insulated from every first trace, each second trace being coupled to a second cable contact; and
a fuse coupling one of said first traces to one of said second traces.

5,813,882
CONNECTOR DEVICE
Hitoshi Saito, and Hisashi Tsukamoto, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 16, 1996, Ser. No. 731,931
Claims priority, application Japan, Oct. 20, 1995, 7-272992
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—595 **7 Claims**



1. A connector, comprising:
a housing;
terminal accommodating chambers formed in said housing, said terminal accommodating chambers into which terminals are inserted;
a front holder, for fixing said terminals, inserted into a front portion of said housing; and
a drawing portion formed on said front holder, said drawing portion having a hole with at least one engaging surface internally thereof which immediately contacts and engages with a mating surface of a drawing tool upon initial insertion thereof into said hole, said engaging surface and said mating surface being of complementary shape to each other and being configured to prevent relative lateral movement therebetween.

5,813,883
CONNECTOR FOR MICRO CHANNEL PRINTED CIRCUIT BOARD
Yu Chuan Lin, No. 28, Wu Chuan 8 Rd., Wu Ku Hsiang, Taipei Hsien, Taiwan
Filed Sep. 11, 1996, Ser. No. 712,628
Int. Cl.[6] H01R *23/70*
U.S. Cl. 439—637 **9 Claims**

1. A connector for micro channel printed circuit board, comprising
a daughter board, a dielectric enclosure, at least a pair of opposing internal conducting plates, at least a pair of opposing external conducting plates, and a mother board;
at least a mounting slot being provided on the daughter board, an inserting groove being formed at a center of the dielectric enclosure for accepting part of the daughter board, at least a mounting post being provided in the inserting groove at a position corresponding to the mounting slot, a plurality of accepting slots which are isolated by a plurality of inner walls respectively being arranged in array along two sides of the inserting groove, a rim of each of the inner walls being used to divide the inserting groove, in which at a bottom of each of the opposing rims there is an intermittent post dividing each the accepting slot into two sections on two sides respectively, each of the sections of each the accepting slot including an internal accepting slot, two barriers and an external accepting slot which has a fixing groove provided thereon, wherein a width of the accepting slot is more than twice larger than a thickness of the conducting plate, so that it is possible to array in staggering the pair of internal conducting plates and the

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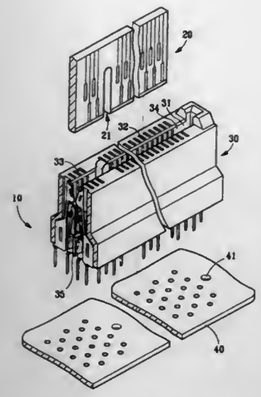


pair of the external conducting plates which are all side cross sectional contact type;

the pair of internal conducting plates each comprising a base, a hanging portion which extends upwards from the base, and a corresponding contact part which is positioned adjacent to a free end of each the internal conducting plate, and that on a plate surface of the contacting part, there is a first protruding portion which is protruding forwards, so that the internal conducting plates, which are settled in the accepting slot, allowing a free movement thereof by the first protruding portion within a fixed range of spacing for assuring not to escape off side from the spacing, each of the internal conducting plates further comprising a welded foot extended downwardly from another end of the internal conducting plate to a bottom of the dielectric enclosure, a slot gap cut in L-shape being provided between the protruding portion and the hanging beam, that the cut portion is folded forwards to form a second protruding portion with an inclined arc shape, so that the corresponding internal conducting plate is provided with a sufficient range for movement and the internal conducting plates is secured firmly thereto, two sharp protrusions being provided on each end of the hanging beam and the protruding portion respectively, therefore when the pair of opposing internal conducting plates are clipped into the respective internal accepting slot, the two first protruding portions immediately contact with an inner wall surface of the internal accepting slot, at the same time, the intermittent post recessing between the two protruding portions, and that the two second protruding portions and the protrusions are clipped to the barriers, so that, the internal conducting plates are firmly positioned and clipped from all directions to the internal accepting slot;

the opposing pair of external conducting plates each comprising a base and a hanging beam extending upwards from the base which has a contact part positioned adjacent to a free end of each of the external conducting plates, and that on the surface of the contact part of each of the external conducting plates, there is a first protruding portion protruding backwards, and that a top width of the external accepting slot is enlarged to more than two times of a thickness of each of the external conducting plates, so that an element for ejection mold is able to be made large enough to maintain a sufficient strength and retain an unanimity of a spacing between the external conducting plates, and that on the surface of the base, there is a second protruding portion protruding backwards by punching, so that a middle part of each of the external conducting plates has only two L shaped surfaces which can be tightly clipped to the respective external accepting slot which width is several times larger than a thickness of each of the external conducting plates, a welded foot being extended downwardly from another end of each of the external conducting plates to the bottom of the dielectric enclosure; and

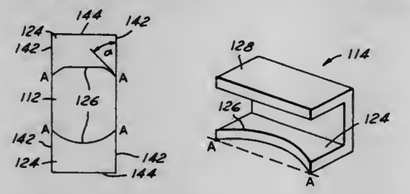
the internal conducting plates and the external conducting plates being made by punching reversely arrayed face to face and connected with two material tapes and connecting strips, the internal and external conducting plates being reversely bent to make a spacing staggering therebetween, so that the material tapes and the connecting strips are more convenient for further treatment, the first and second protruding portions on the internal conducting plates and the first and second protruding portions on the external conducting plates being formed by punching process in the reverse direction with each other for guiding and positioning, and to clip into the accepting slot in the way staggering each other with a spacing, and that the pair of the internal conducting plates and the pair of the external conducting plates are isolated by the inner wall, so that the unanimity of spacings among numerous internal and external conducting plates is retained, the middle parts of the internal and external conducting plates being firmly secured to a lower section of the accepting slot which width is several times larger than the thickness of the internal and external conducting plates, upper portions of the internal and external conducting plates providing the unanimous spacing for inserting the daughter board, so that when it is being drawn out, a uniformly distributed force is exert on a center line of the internal and external conducting plates.

5,813,884

MENISCUS-SHAPE TERMINATIONS FOR LEADLESS ELECTRONIC COMPONENTS

Yi-Hsin Pao, Livonia; Dangrong Ronald Liu, West Bloomfield; Chan-Jiun Ed Jih, Troy, and Xu Song, Westland, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Apr. 7, 1997, Ser. No. 835,366
Int. Cl.[6] H01R *4/02*
U.S. Cl. 439—876 **18 Claims**



1. A leadless electronic component which avoids solder joint crack initiation, comprising:

a body portion having terminations arranged thereabout,

each termination having a bottom portion with an interior edge, wherein said interior edge has a substantially meniscus shape oriented so as to be concave with respect to a centroid of said leadless electronic component.

5,813,885

SOCKET ASSEMBLY FOR LAMP

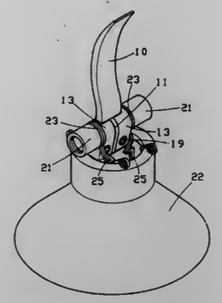
Wei Hong Shen, 6F, No. 416, Sec. 4, Jen Ai Road, Taipei, Taiwan

Filed Jan. 15, 1997, Ser. No. 783,669
Int. Cl.[6] H01R *17/00*
U.S. Cl. 439—699.2 **3 Claims**

1. A lamp socket assembly, comprising:

an electrical insulating member having a pair of shafts extending from opposing sides thereof and an isolating plate extending from a lower end thereof, each of said shafts having a threaded portion formed thereon;

a pair of socket members mounted on said electrical insulating member, each of said socket members being formed of an electrically conductive material and having a hole formed



therethrough for passage of a respective one of said shafts therethrough, each of said socket members having a slot formed in a lower end thereof and a threaded hole formed in open communication with said slot for securing a connector pin of a light bulb disposed within said slot with a locking screw threadedly engaged with said threaded hole; and,

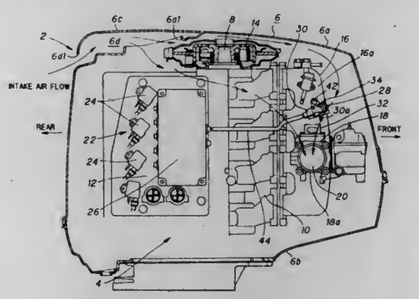
a pair of connecting rods respectively threadedly engaged with said threaded portions of said pair of shafts, each of said connecting rods being formed of an electrically conductive material and in contiguous contact with a respective one of said pair of socket members.

5,813,886

STRUCTURE FOR MOUNTING CONTROL SENSOR IN OUTBOARD MOTOR ENGINE

Nobuyuki Shomura, Hamamatsu, Japan, assignor to Suzuki Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 30, 1997, Ser. No. 792,573
Claims priority, application Japan, Jan. 31, 1996, 8-015778
Int. Cl.[6] B63H *21/22*
U.S. Cl. 440—1 **8 Claims**



1. A structure for mounting a control means in an engine of an outboard motor which is provided with a fuel injecting unit and a plurality of control sensors including at least an intake air temperature detecting sensor and a pressure detecting sensor for controlling the fuel injecting unit,

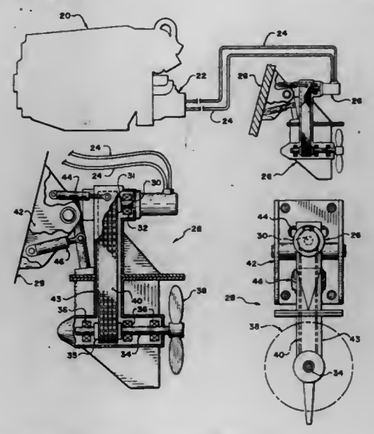
wherein a discrete sensor mounting holder, as a single holding means, for holding the plurality of control sensors is fixed to the engine, said discrete sensor mounting holder being formed of a vibration-proof member.

5,813,887

MARINE PROPULSION SYSTEM

Theodore Mark, R.R. #3, Site 312, C-16, Port Alberni, British Columbia, Canada, V96 7L7

Filed Mar. 20, 1997, Ser. No. 821,069
Int. Cl.[6] B63H *23/00*
U.S. Cl. 440—5 **7 Claims**



1. A marine propulsion system, comprising:

i) a transom;

ii) an engine inboard of the transom;

iii) a steerable screw propulsion unit outboard of the transom, and comprising a propeller shaft mounted for rotation in said propulsion unit and having a propeller mounted thereon;

iv) means for transferring power from said engine to rotate said propeller shaft comprising a hydraulic pump inboard of said transom and coupled to be driven by said engine, a reversible hydraulic motor having a drive shaft and mounted in the propulsion unit whereby said drive shaft rotates on an axis in said propulsion unit above and parallel to the axis of rotation of said propeller shaft, and fluid conduits communicating between said hydraulic pump and said hydraulic motor to transfer pressurized fluid from said hydraulic pump to said hydraulic motor; and

v) flexible belt means for coupling said drive shaft to said propeller shaft and thereby transferring rotational energy from said drive shaft to said propeller shaft, and wherein said drive shaft and said propeller shaft comprise sprockets for receiving said flexible belt means.

5,813,888

SYSTEM FOR FLUSHING A WATERCRAFT ENGINE COOLING SYSTEM

Sigeyuki Ozawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 427,105, Apr. 21, 1995, abandoned. This application Feb. 19, 1997, Ser. No. 802,215
Claims priority, application Japan, Apr. 21, 1994, 6-083437
Int. Cl.[6] B63H *21/32*
U.S. Cl. 440—89 **14 Claims**

1. A jet propelled watercraft having a hull, an engine mounted within said hull, a water jet propulsion unit driven by said engine for propelling said watercraft by pumping water from a body of water in which said watercraft is operating, said engine having a cooling system, said hull defining a rider's compartment, said cooling system including a cooling jacket, a coolant conduit for delivering a portion of the water pumped by said jet propulsion unit to said cooling jacket, a flushing conduit extending from said coolant conduit and terminating in an end disposed in a portion of

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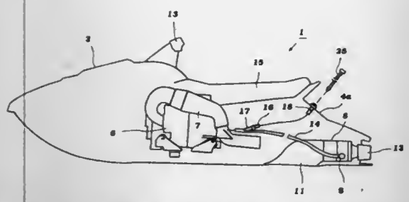
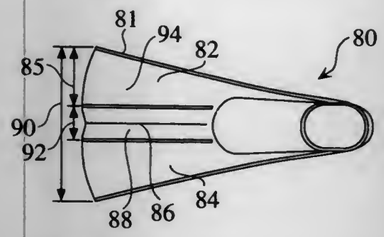


said hull, means for providing a detachable connection between a flushing hose and a flushing conduit end for flushing both said cooling system and said jet propulsion unit with fresh water.

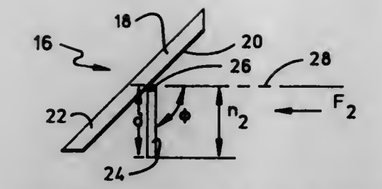
5,813,889
EXPANDABLE SWIM FLIPPER
Alan Perry, San Jose, and Peter H. Müller, Los Gatos, both of Calif., assignors to Alan Perry, San Jose, Calif.
Filed Feb. 25, 1997, Ser. No. 806,642
Int. Cl.[6] A63B *31/11*
U.S. Cl. 441—64 **21 Claims**



1. A swim flipper, comprising:
a shoe; and
a blade having an upper surface, a lower surface, a width and a surface area and including at least an expandable portion thereof and joined to said shoe;
wherein in a first position, said expandable portion of said blade is radially expanded to increase said width and said surface area in response to water resistance directed to said upper surface of said blade;
wherein in a second position, said expandable portion of said blade is radially contracted to decrease said width and said surface area in response to water resistance directed to said lower surface of said blade.

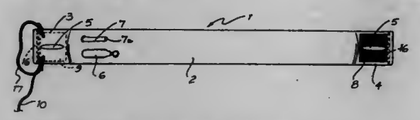
5,813,890
PIVOTING FIN WITH ELASTIC BIAS
Roger A. Benham, P.O. Box 830, San Diego, Calif. 92112
Continuation-in-part of Ser. No. 712,959, Sep. 12, 1996, Pat. No. 5,664,979. This application Aug. 12, 1997, Ser. No. 909,614
Int. Cl.[6] B63B *1/00*
U.S. Cl. 441—79 **20 Claims**

1. A pivoting fin assembly for mounting to a lower surface of a watercraft, the fin assembly comprising:
a base for attachment in a fixed position to a watercraft hull lower surface, the base having first hinge means having pin receiving means defining a hinge axis;
a fin having an inner end having second hinge means for pivotally securing to said first hinge means on said base for pivoting about said hinge axis; and
an elastomeric spring member disposed between said base and said fin for elastically biasing said fin to a central position and



resisting pivotal movement of said fin from said central position relative to said base.

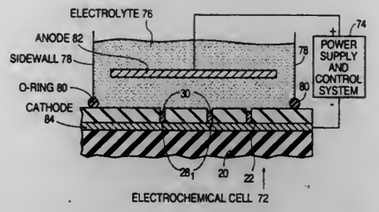
5,813,891
LIFE-SAVING AID
John Boden McNamee, Kellyville, Australia, assignor to Flube Pty. Ltd., Australia
PCT No. PCT/AU95/00309, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/32890, PCT Pub. Date Dec. 7, 1995
PCT Filed May 29, 1995, Ser. No. 737,776
Claims priority, application Australia, May 27, 1994, PM 5911
Int. Cl.[6] B63C *9/08*
U.S. Cl. 441—108 **7 Claims**



1. An inflatable life-saving aid comprising:
an elongate closed tube of flexible material having inflation means at or adjacent a proximal end of the tube, the tube and inflation means being configured to form, when inflated, an elongate substantially linear cylinder sufficiently rigid to at least support its own weight when held horizontally from the proximal end; and
hand grips provided at the proximal and distal ends of the tube, respectively, such that the life-saving aid can be held by the hand grip at the proximal end and extended to another for grasping of the hand grip at the distal end.

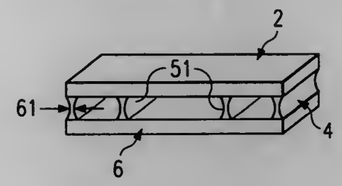
5,813,892
USE OF CHARGED-PARTICLE TRACKS IN FABRICATING ELECTRON-EMITTING DEVICE HAVING RESISTIVE LAYER
Christopher J. Spindt, Menlo Park, and John M. Macaulay, Palo Alto, both of Calif., assignors to Candescent Technologies Corporation, San Jose, Calif.
Division of Ser. No. 447,470, May 22, 1995, Pat. No. 5,562,516, which is a division of Ser. No. 158,102, Nov. 24, 1993, Pat. No. 5,559,389, which is a continuation-in-part of Ser. No. 118,490, Sep. 8, 1993, Pat. No. 5,462,467. This application Jul. 12, 1996, Ser. No. 678,565
Int. Cl.[6] H01J *9/02*
U.S. Cl. 445—24 **10 Claims**

1. A method comprising the steps of:
causing charged particles to pass through a track-susceptible layer to form a multiplicity of charged-particle tracks therethrough;
creating corresponding apertures through the track-susceptible layer by a procedure that entails etching the track-susceptible layer along the charged-particle tracks;
etching an underlying electrically conductive gate layer through the apertures to form corresponding gate openings through the gate layer;



etching an underlying electrically insulating layer through the gate openings to form corresponding dielectric open spaces substantially through the insulating layer down to a highly resistive layer of an underlying lower electrically conductive region; and
forming a like multiplicity of electron-emissive elements over the resistive layer such that each electron-emissive element contacts the resistive layer through a corresponding one of the dielectric open spaces.

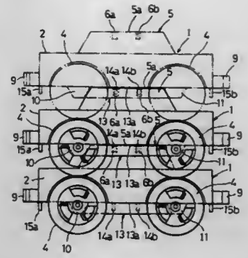
5,813,893
FIELD EMISSION DISPLAY FABRICATION METHOD
Richard K. Robinson, Weston, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Filed Dec. 29, 1995, Ser. No. 581,046
Int. Cl.[6] H01J *9/26*
U.S. Cl. 445—25 **29 Claims**



1. A method for fabricating a field emission display containing at least one electron emitter site comprising the steps of:
arranging a sealing layer between a face plate and a substrate to encase said at least one electron emitter site,
heating the sealing layer by heating a wire in close proximity to the sealing layer until the sealing layer adheres to the face plate and the substrate to create an enclosed volume, and
slightly increasing the volume between the face plate and the substrate by applying a separating force between the face plate and substrate.

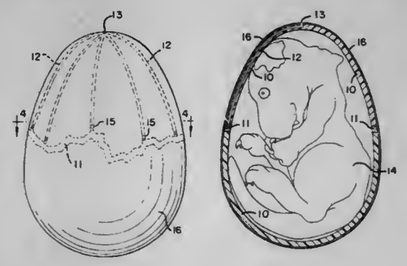
5,813,894
RUNNABLE BLOCK AND BLOCK TOY USING THE SAME
Tomoru Tohyama, Machida, Japan, assignor to Asahi Corporation, Tokyo, Japan
Filed Apr. 24, 1996, Ser. No. 637,040
Claims priority, application Japan, Apr. 28, 1995, 7-129344
Int. Cl.[6] A63H *33/04;17/26*
U.S. Cl. 446—95 **26 Claims**

1. A block toy having at least two runnable blocks, wherein each of said runnable blocks comprises:
a block body having upper and lower engage sections respectively provided on top and bottom surfaces of said block body and being engageable with respective engage sections of another block body; and



a plurality of wheels rotatably attached to both sides of said block body,
whereby a part of each of said wheels protrudes farther downward than a lowermost surface of said block body, and wherein when other block bodies are coupled to a top and bottom of one block body, respectively, a diameter of each wheel is set approximately equal to a distance from an attaching surface of said upper engage section to said lower engage section of said other runnable block located above said one block body, and to an attaching surface of said lower engage section to said upper engage section of said other runnable block located below said one block body.

5,813,895
TOY EGG
Deborah A. Cho, 2210 Dean St. Unit G, St. Charles, Ill. 60175
Filed Jun. 27, 1997, Ser. No. 883,741
Int. Cl.[6] A63H *23/00;3/36*
U.S. Cl. 446—153 **17 Claims**



1. A toy egg comprising:
a shell with an outer surface, an inner surface defining an interior hollow cavity, and a central portion between the outer and inner surfaces,;
a toy figure located in said cavity;
the shell being formed of at least two pieces which are joined by a liquid-soluble adhesive disposed in the central portion;
at least one internal channel substantially surrounded by the central portion of one of said pieces, and communicating with the adhesive;
an access to said channel defining an opening in the outer surface of the shell, so that liquid may be entered into said opening and may move through the channel to the adhesive without flooding the cavity, causing the adhesive to dissolve and the pieces of the shell to separate exposing the toy figure.

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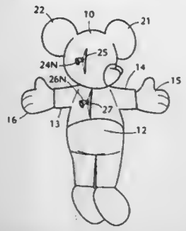
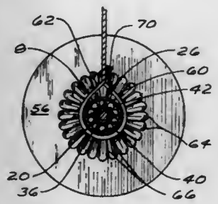
5,813,896
COLLAPSIBLE STUFFED TOY FIGURES
Donald Spector, 380 Mountain Rd., Union City, N.J. 07080
Filed Apr. 25, 1997, Ser. No. 840,655
Int. Cl.[6] A63H *3/06*
U.S. Cl. 446—221 **7 Claims**



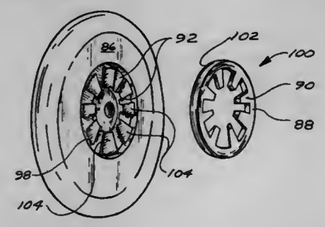
1. A toy figure comprising:
A. a fabric casing shaped to define a figure having a head, a torso, a neck hinging the head to the torso and arm and leg appendages hinged to the torso;
B. compressible stuffing in the appendages to impart a three-dimensional form thereto;
C. a balloon inflated in the head to impart a three dimensional form thereto, said head having a slit therein to receive the balloon in a deflated state with a neck of the balloon projecting through the slit to permit inflation thereof; and
D. a balloon inflated in the torso to impart a three dimensional form thereto, said torso having a slit therein to receive the balloon in a deflated state with a neck of the balloon protecting throughout slit to permit inflation thereof whereby by omitting the balloons from the head and the torso, the figure may be collapsed and flattened, with the appendages folded over the flat torso and the flat head folded thereover to assume a more compact form suitable for packaging.

5,813,897
YO-YO HAVING AN IMPROVED TETHER ENGAGEMENT AREA
Hans W. Van Dan Elzen, Tempe, and Thomas J. Van Dan Elzen, Oro Valley, both of Ariz., assignors to Playmaxx, Inc., Tucson, Ariz.
Filed May 8, 1997, Ser. No. 855,711
Int. Cl.[6] A63H *1/30*
U.S. Cl. 446—250 **14 Claims**



1. A yo-yo comprising:
first and second side members;
a tether anchor located between said side members;
a securement means for securing together said side members;
a tether secured to said tether anchor and adapted to be wound thereon; and
wherein each of said side members includes a center portion encircled by a rim portion, wherein said center portion has a sidewall adjacent said tether, wherein said sidewall includes a first surface and a second surface, wherein said first surface faces away from said tether and in conjunction with a surface of the rim portion forms a concave area that faces away from said tether, wherein said second surface, in an area adjacent said tether anchor, faces said tether, is planar and is oriented substantially perpendicular to a center axis of said tether anchor, wherein said second surface includes a plurality of elongated grooves proximate said tether anchor and adapted for engagement to said tether, wherein each of said grooves is indented in said planar portion of said second surface and has a bottom portion that is indented in said sidewall and is recessed relative to a plane formed by a portion of said second surface proximate said tether anchor, and wherein said grooves are radially-oriented about said center axis of said tether anchor.

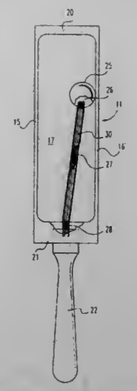
5,813,898
YO-YO HAVING ENGAGEMENT PADS PROXIMATE ITS AXLE
Hans W. Van Dan Elzen, Tempe, and Thomas J. Van Dan Elzen, Oro Valley, both of Ariz., assignors to Playmaxx, Inc., Tucson, Ariz.
Continuation-in-part of Ser. No. 855,711, May 8, 1997. This application Sep. 15, 1997, Ser. No. 929,588
Int. Cl.[6] A63H *01/30*
U.S. Cl. 446—250 **25 Claims**



1. A yo-yo comprising:
first and second side members;
a tether anchor located between said side members;
a securement means for securing together said side members;
a tether secured to said tether anchor and adapted for winding thereon; and
wherein each of said side members has a tether-facing surface that faces a portion of said tether located adjacent said tether anchor, wherein said surface of at least one of said side members features a plurality of engagement pads located in a spaced-apart relation about the tether anchor, wherein said engagement pads are located in complementary grooves in the associated side member, wherein each engagement pad has an exterior surface that has a coefficient of friction greater than a coefficient of friction of a surrounding area of said tether-facing surface and wherein said pads function to facilitate engagement between the tether and at least one of said side members.

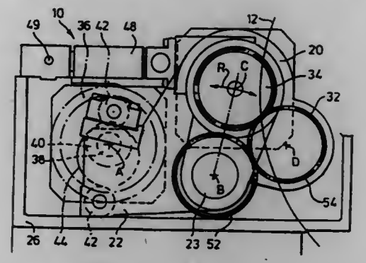
5,813,899
GAME CALL AND METHOD
Michael W. Hartley, 5335 W. Killarney Ct., Jasper, Ind. 47546
Filed Jan. 22, 1997, Ser. No. 786,857
Int. Cl.[6] G10D *13/06*
U.S. Cl. 446—422 **4 Claims**

1. A game call comprising:
an open sided, wood, elongated box having three closed sides, a top and a bottom,
said three sides including two opposite sides and a back side,
a handle fixed to the bottom of said box,
a wood knocker ball,



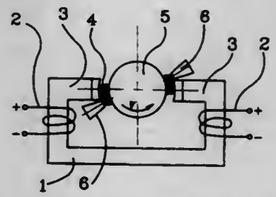
a coil spring having first and second opposite ends with said first end fixed to said knocker ball and said second end fixed to said handle and to the bottom of the box
and a shrink tube surrounding said coil spring and arranged to stiffen the coil spring and to position the knocker ball in spaced relation to the three closed sides of said box
whereby said knocker ball is adapted to strike the opposite sides of the box when the box is moved rapidly back and forth by an individual grasping the handle to make a sound like a woodpecker.

5,813,900
GRINDING MACHINE FOR GRINDING CYLINDRICAL WORKPIECES
Colin Wyatt, Dunchurch, England, assignor to T&N Technology Ltd., Rugby, England
PCT No. PCT/GB95/02241, § 371 Date Feb. 14, 1997, § 102(e) Date Feb. 14, 1997, PCT Pub. No. WO96/09137, PCT Pub. Date Mar. 28, 1996
PCT Filed Sep. 12, 1995, Ser. No. 793,054
Claims priority, application United Kingdom, Sep. 20, 1994, 9418923
Int. Cl.[6] B24B *49/00;51/00*
U.S. Cl. 451—10 **6 Claims**



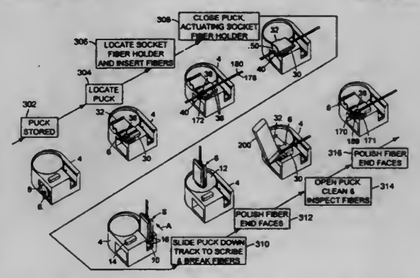
1. A grinding machine comprising a grinding wheel having an abrasive circumferential surface arranged to remove material from a workpiece when the grinding wheel is applied thereto, rotating means operable to rotate the grinding wheel about a central axis thereof, a workpiece support arranged to support a workpiece so that the workpiece can turn about an axis of the support, turning means operable to turn a workpiece on said support about the axis of the support to present different parts of the surface of the workpiece to the grinding wheel, orientation detecting means operable to detect the orientation of the workpiece on the support, moving means operable to bring about relative movement between the workpiece support and the grinding wheel, the moving means being arranged to move the workpiece support arcuately about an axis of the machine to bring about said relative movement, and control means operable to control the operations of the turning means and of the moving means, in accordance with signals received from the orientation detecting means, so that the workpiece is ground to a desired shape, wherein the machine also comprises correcting means operable, in response to the operation of the moving means, to cause the output of the orientation detecting means to be altered to compensate, at least substantially, for angular alterations in the point of contact between the workpiece and the grinding wheel caused by the arcuate movement of the workpiece support.

5,813,901
METHOD AND DEVICE FOR MAGNETIC-ABRASIVE MACHINING OF PARTS
Gennady Kremen, Brooklyn, N.Y., assignor to Scientific Manufacturing Technologies Inc, Brooklyn, N.Y.
Filed Mar. 27, 1997, Ser. No. 827,159
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—28 **12 Claims**



1. A method of magnetic-abrasive machining of a part, comprising the steps of forming a magnetic field; arranging a part to be machined in the magnetic field; supplying a magnetic-abrasive powder in a machining zone toward a surface of the part to be machined; and supplying a fluid jet under pressure toward the magnetic-abrasive powder so as to move the magnetic-abrasive powder relative to the surface of the part to be machined.

5,813,902
OPTICAL FIBER END-FACE PREPARATION AND CONNECTOR ASSEMBLY
Gordon Wiegand, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 14, 1997, Ser. No. 837,177
Int. Cl.[6] B24B *7/07*
U.S. Cl. 451—65 **15 Claims**



7. A method of preparing an optical fiber end-face for interconnection, comprising the steps of:

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providing a polishing puck having a body and a planar surface attached to an end of the body;

retaining the optical fiber within the puck body such that an end of the fiber extends through a hole in the planar surface;

guiding the puck past a scribe and a fiber bender with the fiber extending through the hole in the planar surface of the puck; and

breaking the fiber where it just extends from the planar surface of the puck by introducing a flaw in the fiber with the scribe and bending the fiber with the fiber bender.

5,813,903

SANDING APPARATUS WITH A BRAKE SYSTEM

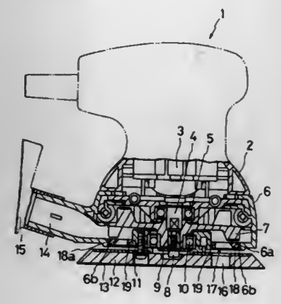
Kunio Amano; Katsuhiko Sasaki; Tetsuhisa Kaneko; Masatoshi Kobayashi, and Koji Takeuchi, all of c/o Makita Corporation 11-8 Sumiyoshi-cho 3-chome, Anjo-shi, Aichi-ken, Japan

Filed Mar. 7, 1997, Ser. No. 813,658

Claims priority, application Japan, Mar. 8, 1996, 8-052036; Dec. 6, 1996, 8-327201

Int. Cl.[6] B24B *23/03*

U.S. Cl. 451—294 **19 Claims**



1. A sanding apparatus comprising:

a housing having an opening at a lower end thereof;

a motor provided in said housing, said motor having a motor shaft protruding from said opening of said housing;

a connecting shaft including an eccentric movement mechanism, said connecting shaft being coupled to said motor shaft by said eccentric movement mechanism;

a pad coupled to said connecting shaft for performing a predetermined movement in response to rotation of said motor; and

brake means, penetrated by said connecting shaft, provided at said opening of said housing, said brake means being symmetrically disposed about said connecting shaft and including at least one contact portion

which is in contact with said connecting shaft so as to restrain the movement of said connecting shaft and

which allows movement of said connecting shaft at normal operating speed when the pressure applied from said pad to said connecting shaft exceeds a predetermined value.

5,813,904

METHOD AND APPARATUS FOR SKINNING FROZEN FISH

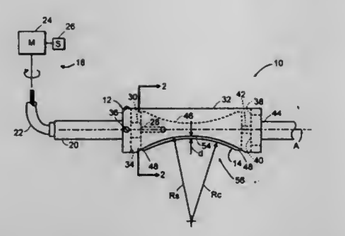
Konstantinos Aslanis, Milton; Thomas Joseph Parenteau, Brockton, and James Robert Dawson, Peabody, all of Mass., assignors to Aslanis Seafoods, Inc., Quincy, Mass.

Filed Apr. 4, 1996, Ser. No. 627,420

Int. Cl.[6] A22B *5/16*

U.S. Cl. 452—133 **21 Claims**

1. An apparatus for skinning a frozen fish comprising,



a housing configured to be grasped by a user, said housing having an axis and including a shield forming an aperture therein;

a cutter supported for rotation within said shield along an axis parallel to said housing axis, said cutter comprising a generally cylindrical member having a contoured side formed by a plurality of longitudinally extending teeth having trailing edge radial relief resulting in angled surfaces between respective leading edges and trailing edges of the teeth, wherein at least a portion of said cutter is exposed by said shield proximate said aperture to form a working zone; and

means for transmission of torque to said cutter coupled in driving engagement therewith.

5,813,905

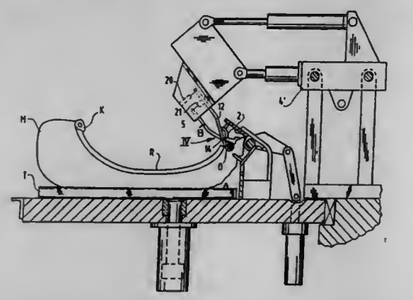
DEVICE AND APPARATUS FOR DEBONING HALVES OF SLAUGHTERED ANIMALS

Johannes Wilhelmus Boeijen, Oss, and Maurice Eduardus Theodorus Van Esbroeck, Bemmel, both of Netherlands, assignors to Stork Protecon-Langen B.V., Netherlands

Continuation-in-part of Ser. No. 251,846, May 31, 1994, abandoned. This application Feb. 12, 1997, Ser. No. 798,109

Int. Cl.[6] A22C *17/04*

U.S. Cl. 452—135 **34 Claims**



1. A device for removing small bone remnants from pieces of meat, comprising: at least two members configured to close and open toward and away from each other, each of which is provided with a contour cutting edge, wherein in a closed position of the members the contour cutting edges abut each other, wherein at least one of the members has a cup-shaped form to receive the bone remnant to be removed, and wherein in the closed position a hollow space is formed between the closed members such that the bone remnant is wholly contained within the hollow space.

5,813,906

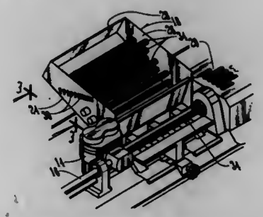
METHOD AND MEANS OF SELECTING A STUFFING HORN FOR A SAUSAGE ENCASING MACHINE WITH A SHIRRED CASING TO BE USED IN THE MACHINE

Robert Wright Phillips, Waukee, Iowa, assignor to Townsend Engineering Company, Des moines, Iowa

Filed Jun. 11, 1997, Ser. No. 872,690

Int. Cl.[6] A22C *11/00*

U.S. Cl. 452—36 **8 Claims**



1. A sausage stuffing machine having a pump for connection to a source of meat emulsion for delivery of said meat emulsion to a linking means through an elongated detachable hollow stuffing tube with an elongated shirred telescopically formed casing tube having an effective interior diameter when shirred coinciding with the outside diameter of said stuffing tube, comprising,

said machine having a substantially flat wall member mounted thereon,

a plurality of apertures in said panel having diameters corresponding to the outer diameters of a plurality of different sized stuffing tubes usable on said machine with indicia on said wall member adjacent said apertures indicating the diameter thereof, so that when a given shirred casing tube having a known interior diameter is to be used in said machine, the operator of the machine can select a stuffing tube which has an outer diameter corresponding to the interior diameter of said known interior diameter of said casing, and wherein said operator can confirm the actual outside diameter of the selected stuffing tube by inserting it through an aperture in said wall of corresponding to interior diameter of said given shirred casing tube.

5,813,907

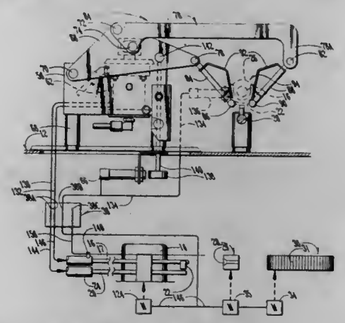
CASING HOPPER FOR MEAT EMULSION MACHINE, AND METHOD OF USE THEREOF

Kenneth L. Lebsack; Craig A. Smiens, both of Ankeny, and Brent M. Veldkamp, Des Moines, all of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Sep. 23, 1997, Ser. No. 933,906

Int. Cl.[6] A22C *11/00*

U.S. Cl. 452—32 **12 Claims**



1. A sausage encasing machine, comprising,

a frame,

a meat emulsion pump,

a hollow meat emulsion stuffing horn having a discharge end operatively connected to said pump and being longitudinally moveable on said frame,

power means on said frame for selectively longitudinally moving said stuffing horn in forwardly or rearwardly directions with respect to said frame,

a rotatably mounted chuck on said frame having a center opening aligned with a center axis of said stuffing horn,

a linking device mounted on said frame downstream from said chuck for linking a strand of meat emulsion extruded from the discharge end of said stuffing horn,

a casing hopper mounted on said frame above and between said pump and said chuck, and adapted to hold a plurality of shirred hollow elongated casings,

a cradle mechanism in said hopper having opposite spaced moveable finger assemblies therein for guiding an elongated shirred hollow elongated casing in said hopper to a position of longitudinal alignment with said stuffing horn.

5,813,908

APPARATUS FOR DEBONING A LEG OF SLAUGHTERED POULTRY COMPRISING UPPER LEG AND LOWER LEG

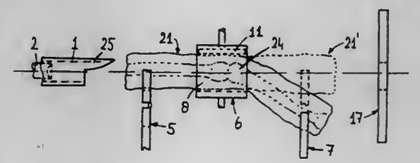
Jacob Jan Van Craaikamp, Oostzaan, Netherlands, assignor to Machinefabriek Meyn B.V., Oostzaan, Netherlands

Filed Apr. 23, 1997, Ser. No. 839,084

Claims priority, application Netherlands, Apr. 23, 1996, 1002924

Int. Cl.[6] A22C *17/04*

U.S. Cl. 452—136 **10 Claims**



1. A apparatus for automated deboning of a leg of a slaughtered poultry, wherein the leg includes an upper leg bone and a lower leg bone with attached meat and a knee joint connecting said upper and lower leg bones, said apparatus comprising:

a mechanism configured to support and straighten said poultry leg;

a stripping diaphragm with a hole defined therein disposed at one end of said mechanism to receive one of said upper or lower leg bones and to strip said meat from said bones as they are pushed through said hole; and

a pushing device disposed generally opposite said stripping diaphragm to engage and push said bones through said stripping diaphragm, said pushing device comprising a generally hollow tube longitudinally movable relative to said stripping diaphragm, said hollow tube having a forward end engaging one end of said poultry leg generally between said meat and bone and movable generally up to said knee joint, said hollow tube further comprising a projection member defined on said forward end having a shape so as to move over said knee joint as said hollow tube moves towards said stripping diaphragm, said hollow tube with said projection member disposed over said knee joint subsequently movable through said diaphragm with said leg bones.

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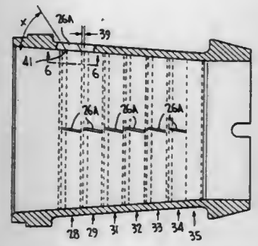
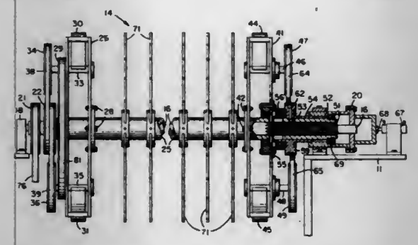
5,813,909
DEBONING MACHINE WITH SLOTTED SEPARATION CHAMBER
Thomas C. Goldston, South Lehi, Utah, assignor to Beehive, Inc., Sandy, Utah
Filed Dec. 6, 1996, Ser. No. 761,634
Int. Cl.[6] A22C *17/04*
U.S. Cl. 452—138 **7 Claims**



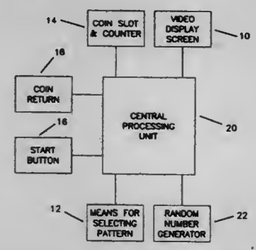
1. A compression type deboning machine having an auger rotatable in one direction with a perforated separation chamber for separating meat from bone by the cooperation of sharp edges of the separation chamber and fluted turns of the auger upon conveyance of bone connected meat from a feed end of the machine in a downstream direction toward a discharge end of the machine at which means are provided for creating a back pressure to provide a choke for controlling pressure within the separation chamber, the improvement wherein perforations of said separation chamber comprise a plurality of elongated slots each formed of a pair of spaced apart side walls presenting interior side edges, and opposing arcuate end walls presenting interior arcuate end edges, said slots being oriented such that said side edges lie at an angle relative to the central axis of said separation chamber so as to be tilted in said one direction of auger rotation, wherein at least one of the slot walls lies at a predetermined reverse angle to the inner surface of said chamber, said side edges and said end edges cooperating with the fluted turns of the auger to shave or peel away the meat from the bone to produce a coarser and highly textured separated product.

5,813,910
ADJUSTABLE FOUR-WEIGHT SHAKER HEAD
David Jeffrey Meester, Fresno, and Franklin Paul Orlando, Morgan Hill, both of Calif., assignors to FMC Corporation, Chicago, Ill.
Division of Ser. No. 539,918, Oct. 6, 1995, Pat. No. 5,685,773.
This application Jun. 5, 1997, Ser. No. 870,146
Int. Cl.[6] A01D *46/00*
U.S. Cl. 460—113 **19 Claims**



5. An apparatus for harvesting fruits from plants, comprising:
a frame;
a plurality of wheels supporting said frame;
a shaking mechanism for removing the fruits from the plant supported by said frame; and
shaker for shaking the shaking mechanism, comprising:
a set of primary eccentric weights;
a set of secondary eccentric weights;
a means for driving the set of primary eccentric weights in an angular direction, mechanically connected to the set of primary eccentric weights;
a means for driving the set of secondary eccentric weights in an angular direction, mechanically connected to the set of secondary eccentric weights; and
means for phasing, mechanically connected between the means for driving the set of primary eccentric weights and the means for driving the set of secondary eccentric weights;
the means for phasing including means for maintaining the set of primary eccentric weights and the set of secondary eccentric weights at the same angular speed, with a phase difference therebetween, and means for changing the phase difference between the primary eccentric weights and the secondary eccentric weights while both sets are in motion.

5,813,911
PATTERN KENO GAME
Marc Margolin, Culver City, Calif., assignor to Bally Gaming, Inc., Las Vegas, Nev.
Filed Aug. 21, 1996, Ser. No. 701,309
Int. Cl.[6] A63F *9/22*
U.S. Cl. 463—19 **19 Claims**



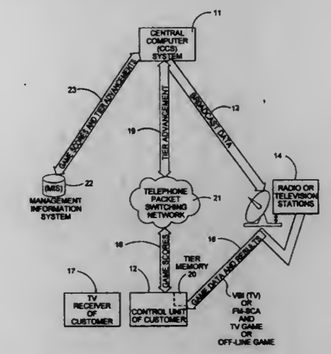
1. A method of playing a game having a playing board divided into a desired number of squares, a means for a player to select a pattern of squares on the playing board and a means for generating a random selection of squares on the playing board, comprising:
preparing a template from the pattern of squares selected by the player;
generating a random selection of squares on the playing board by the game;
overlaying the template over the playing board, in each of the positions where the template is included;
counting the number of randomly selected squares contained within the template;
determining the payout; and
crediting the payouts to the player.

5,813,912
TRACKING AND CREDIT METHOD AND APPARATUS
James Doouglas Shultz, 2386 Dundee Cir., South Lake Tahoe, Calif. 96150
Filed Jul. 8, 1996, Ser. No. 676,932
Int. Cl.[6] A63F *9/00*
U.S. Cl. 463—25 **8 Claims**

1. The method of tracking and recording the actions of a participant in an activity comprising: supplying the participant with an encoded device which can record and memorize each of a defined number of actions of the participant; providing an overseer of the activity with means to independently record participation actions

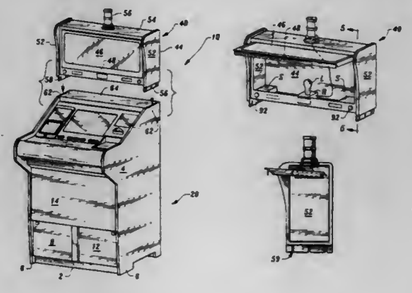
and results on the encoded device and on an independent processor; and reviewing the actions and results of the participant by the overseer.

5,813,913
GAME OF SKILL PLAYABLE BY REMOTE PARTICIPANTS IN CONJUNCTION WITH A COMMON GAME EVENT WHERE PARTICIPANTS ARE GROUPED AS TO SKILL LEVEL
Mark K. Berner, Santa Clara, and David B. Lockton, Atherton, both of Calif., assignors to Interactive Network, Inc., Sunnyvale, Calif.
Filed May 30, 1995, Ser. No. 453,403
Int. Cl.[6] A63F *9/22*
U.S. Cl. 463—40 **7 Claims**



1. An apparatus for a game of skill played simultaneously by groups of participants, each group several participants of a particular skill level, remote from each other in conjunction with at least one common game event where each participant player of a game receives one or more scores comprising:
means for providing said common game event and transmitting such event to each of said remote participants;
control unit means associated with each remote participant for receiving game play inputs by each participant and scoring in response to said inputs;
central computer system means for defining a predetermined plurality of game skill levels including an initial lowest skill level and several advanced skill levels and for receiving said game scores and determining one of said predetermined plurality of skill levels of each of said participants for a particular game and also promoting to a relatively higher skill level more successful players of each game, said central computer system also including means for grouping participants together having similar said skill levels, and communicating relative game scores to said participants only for that particular skill level;
and means for permanently storing the skill level of each participant for each type of common game event.

5,813,914
GAMING MACHINE SLANT TOP CABINET
Linn A. McKay, and Robert M. Dickenson, both of Las Vegas, Nev., assignors to Casino Data Systems, Las Vegas, Nev.
Filed Mar. 25, 1997, Ser. No. 823,491
Int. Cl.[6] G07F *17/34*
U.S. Cl. 463—46 **22 Claims**



1. A gaming cabinet, comprising, in combination:
a base,
a housing extending up from said base,
a top panel overlying said housing,
a cap extending up from said housing rearward of said top panel including a display panel wherein said display panel moves from a vertical plane to a horizontal plane about a pivot, said pivot constrained to ride within a trackway, said trackway allowing telescopic insertion of said display panel into said top cap,
said cap having a substantially rectangular hollow contour and including said front display panel adjacent said top panel,
said display panel including a circumscribing frame including pivot pins at top lateral extremities, said pins captured in said trackway to move said display panel from a display position to a retracted position in said cap.

5,813,915
DAMPER DISK ASSEMBLY HAVING MULTIPLE STAGE DAMPENING CHARACTERISTICS
Hideyuki Imanaka, Moriguchi, Japan, assignor to Exedy Corporation, Osaka, Japan
Filed Feb. 24, 1997, Ser. No. 805,396
Claims priority, application Japan, Mar. 8, 1996, 8-051551
Int. Cl.[6] F16D *3/14*
U.S. Cl. 464—68 **6 Claims**

1. A damper disk assembly comprising:
a pair of circular input plates having central apertures and fixed together;
a hub having a boss arranged in said central apertures, and a flange provided with a first aperture and arranged between said paired circular input plates;
paired sub-plates arranged between said paired circular input plates and at opposite sides of said flange;
a coupling member coupling said paired sub-plates together, and circumferentially movably extending through said first aperture;
a first elastic member circumferentially coupling said paired sub-plates to said flange;

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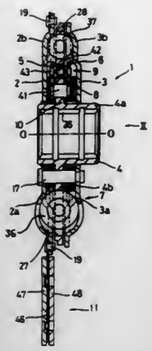


a second elastic member circumferentially coupling said paired circular input plates to said sub-plates, and having a higher rigidity than said first elastic member;

a first frictional resistance generating mechanism including a first friction washer, a second friction washer and a biasing member, said first friction washer having a high friction coefficient member in contact with a side surface of said flange and a plate member fixed to said high friction coefficient member, and having a second aperture through which said coupling member circumferentially movably extends, said second friction washer having a low friction coefficient member in contact with said plate member, and being relatively nonrotatably coupled to said coupling member, and said biasing member biasing said first and second friction washers toward said flange; and

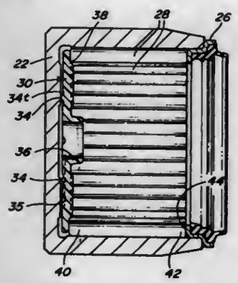
a second frictional resistance generating mechanism for generating a larger frictional resistance than said first frictional resistance generating mechanism when said paired circular input plates rotate relatively to said paired sub-plates.

5,813,916

RETAINED NEEDLE THRUST WASHER

Anthony G. Lentini, St. Clair Shores; Glenn F. Gehrke, Davisburg; Craig Holt, Harrison Township, and Patrick L. Kurzeja, White Lake, all of Mich., assignors to Meritor Heavy Vehicle Systems, LLC, Troy, Mich.

Filed May 3, 1995, Ser. No. 434,376
Int. Cl.[6] F16D *3/16*
U.S. Cl. 464—128 **19 Claims**



1. A bearing assembly for a universal joint comprising:

a bearing cup defining an inner peripheral surface to receive needle bearings;

said needle bearings received adjacent said inner peripheral surface of said bearing cup;

a seal received at an outer end of said bearing cup; and

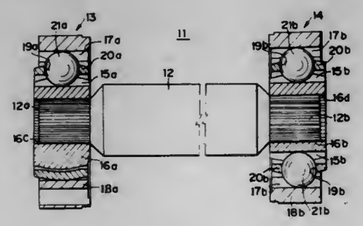
a thrust washer received within said bearing cup and inwardly of said needle bearings, said thrust washer being formed of a molded synthetic material, said thrust washer having a peripheral notch, said needle bearings resiliently retained outwardly radially toward said bearing cup inner peripheral surface within said notch by said seal until said bearing cup is received in a universal joint.

5,813,917

SHAFT ASSEMBLY

Minoru Wakamatsu, 12-7, Kawahara-cho, Okazaki-shi, Aichi-ken 444-21; Takashi Matsuda, 2-55-7, Tanaka-cho, Toyota-shi, Aichi-ken 471; Kohki Kawarada, 7-4-9, Itsutsugaoka, Toyota-shi, Aichi-ken 471, and Hiroshi Hori, 5-102, Shimoichiba-cho, Toyota-shi, Aichi-ken 471, all of Japan

Filed Dec. 4, 1996, Ser. No. 760,413
Claims priority, application Japan, May 12, 1995, 7-344530
Int. Cl.[6] F16D *3/22*
U.S. Cl. 464—140 **3 Claims**



1. A shaft assembly comprising:

a shaft; and

a cross-groove universal joint mounted on each of the two end portions of the shaft, each said cross-groove universal joint having an inner race whose outer circumference includes first inner ball grooves inclined alternately in opposite directions with respect to the axial direction, concentric with the inner race, and an outer race whose inner circumference includes second inner ball grooves oriented to intersect the first inner ball grooves, in which balls are arranged at the intersections between facing ones of the first and second inner ball grooves, and in which said balls are retained by a cage arranged between said inner race and said outer race,

wherein an inner race of a first of said universal joints is fixed on one end portion of said shaft and an inner race of a second of said universal joints is fixed on the other end portion of said shaft such that, with respect to a respective ball groove of said inner race of said first of said universal joints, a ball groove of the inner race of said second of said universal joints inclined in the direction opposed to that of the ball groove of the respective inner race of the first of said universal joints is positioned within a predetermined offset phase range from a complete circumferential in-phase position with respect to the respective ball groove of the inner race of the first of said universal joints,

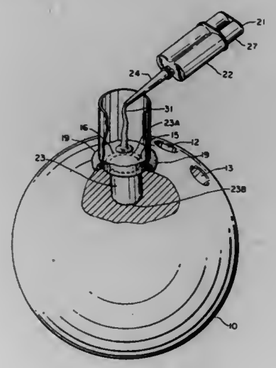
wherein said predetermined offset phase range is selected such that a third compelling force acting in an axial direction of said shaft and generated by said first and second universal joints taken together when said first and second universal joints are rotated, is no greater than a third compelling force generated by a single one of said first and second universal joints taken individually.

5,813,918

METHOD OF EXACTLY DUPLICATING IN A NEW BOWLING BALL, THE THUMB-HOLE OF A REFERENCE BOWLING BALL

Joseph Conigliaro, Rosedale, N.Y., assignor to X-Act Duplicator, Inc., Richmond Hill, N.Y.

Filed Nov. 4, 1996, Ser. No. 743,339
Int. Cl.[6] A63B *43/02*
U.S. Cl. 473—128 **2 Claims**



1. A method for duplicating an existing thumb hole in a reference bowling ball comprising the steps of:

providing a reference bowling ball having a thumb hole and finger holes seperated by a bridge, said holes having a length, texture, inner contour, bevel, size, and shape,

drawing a center-line on the reference ball to be molded that splits a bridge between its finger holes and through a center point of its thumb hole,

making a small notch at a point where the centerline makes contact with the bevel at a front point of the thumb hole,

recording a pitch angle of the thumb hole for accuracy of the thumb hole in the reference ball being molded,

centering a first tubular cylinder around the thumb hole to be molded,

surrounding the first tubular cylinder with clay,

dispensing silicone material into the thumb hole until it enters the first tubular cylinder and covers the bevel and the notch made therein,

waiting 20 minutes until the silicone material has cured into a silicone mold of the reference ball thumb hole,

removing the cured silicone mold from the reference ball thumb hole,

placing the cured silicone mold into a second tubular cylinder,

centering the cured silicone mold in the second tubular cylinder in an upright position so as to form a space between the silicone mold and an inside of the second tubular cylinder,

dispensing urethane material into the space between the mold and second tubular cylinder,

waiting 10–20 minutes until the urethane material has cured into a urethane mold which has the same the length, texture, contour, bevel, size, and shape as the inner surface of the reference ball thumb hole,

removing the silicone mold from the urethane mold,

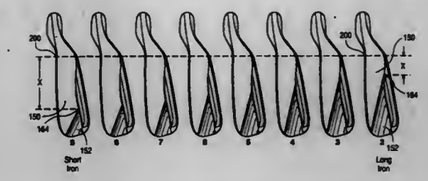
installing the duplicative urethane mold into a new bowling ball hole by an installing means.

5,813,919

DUAL SOLE GOLF CLUB HEAD

Christopher Best, Encinitas; Phil Rodgers, San Diego, and Robert Hirsch, Oceanside, all of Calif., assignors to Cobra Golf, Inc., Carlsbad, Calif.

Filed Jun. 28, 1996, Ser. No. 672,361
Int. Cl.[6] A63B *53/04*
U.S. Cl. 473—290 **20 Claims**



1. A golf club head comprising a head body having a front face, a back side, a heel, a toe, a top, and a sole on a bottom of the head body which contacts the ground when the head addresses a ball; and a hosel in the area of the heel of the club body for receiving a shaft, the sole comprising discontinuous surfaces, including a first surface which extends from the end of the heel toward the toe and a second surface which extends from the toe toward the heel and intersects the first surface along a diagonal line which extends from a leading edge of the toe to an intermediate point between the heel and the toe on a trailing edge of the sole, the first surface having a tangent thereto which makes a first predetermined angle with the ground, and the second surface having a second tangent which makes a second angle with the ground which is greater than the first predetermined angle.

5,813,920

GOLF CLUB GRIP WITH CONSTANT OUTSIDE DIAMETER

Guerin D. Rife, 1310 S. Pennsylvania Ave., Winter Park, Fla. 32789

Filed Apr. 15, 1996, Ser. No. 632,114
Int. Cl.[6] A63B *53/14*
U.S. Cl. 473—300 **3 Claims**

1. A golf club grip for an iron or wood type golf club having a cap end, a cap, an opening end and opening for insertion of a golf club shaft therein; said grip being defined by a round outer surface having a constant outside diameter along the length of the grip from said cap end to said opening end; said opening having an inner diameter being larger in size at said cap end and gradually smaller toward said opening end; and said grip being further

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defined by a wall thickness which increases from said cap end toward said opening end.

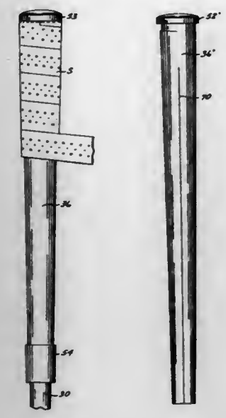
5,813,921
SLEEVE-TYPE GRIP FOR GOLF SHAFTS

Ben Huang, 16652 Gemini La., Huntington Beach, Calif. 92647

Division of Ser. No. 632,578, Apr. 15, 1996, Pat. No. 5,671,923, which is a continuation-in-part of Ser. No. 595,445, Feb. 26, 1996, abandoned, which is a continuation-in-part of Ser. No. 507,575, Jul. 26, 1995, abandoned, which is a continuation-in-part of Ser. No. 58,313, May 3, 1993, which is a continuation-in-part of Ser. No. 953,190, Sep. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 637,931, Jan. 14, 1991, abandoned. This application May 16, 1997, Ser. No. 858,057

Int. Cl.[6] A63B *49/08*

U.S. Cl. 473—300 **4 Claims**



1. In the combination of a golf club shaft handle, and a tapered resilient sleeve for said handle, such sleeve being formed at its upper end with a cap and with a recess below said cap;

a strip consisting of an open-pored felt layer having an inner surface and an outer surface, and a closed pore polyurethane layer having its inner surface bonded to the outer surface of the felt layer, with the pores of such polyurethane layer extending generally normal to the longitudinal axis of the strip, and with the felt layer providing strength for the polyurethane layer while the polyurethane layer both absorbs shocks and provides tackiness so as to inhibit slippage of a user's hand relative to a golf club handle shaft;

the strip having a tapered leading edge that defines a tongue; and

the strip being spirally wrapped about the sleeve between the bottom of the cap and the lower portion of the sleeve, with the tongue of the strip fitting snugly within said sleeve recess to provide a smooth configuration of the strip relative to the sleeve.

5,813,922
GOLF CLUB SHAFT

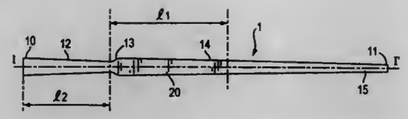
Todd Beach, San Diego, Calif., and Jean-Luc Veux, Rumilly, France, assignors to Taylor Made Golf Company, Inc., Carlsbad, Calif.

Filed Oct. 15, 1997, Ser. No. 951,032

Int. Cl.[6] A63B *53/10*

U.S. Cl. 473—319 **20 Claims**

1. A golf club shaft comprising:



a tubular structure extending along a longitudinal axis and having, along its length, a varying section defined by an external radius and a thickness of said structure;

said shaft including a butt having an external radius and an opposite tip with a smaller external radius than the external radius of said butt;

said shaft including a gripping zone in a vicinity of said butt and a large diameter bending zone of greater deformation during a swing motion located beneath said gripping zone;

said large diameter bending zone having a radius/thickness ratio greater than 4 and including a portion of abrupt increase of the radius/thickness ratio in direction toward a tip;

said structure including a plurality of layers of reinforcing fibers having different orientations with respect to said longitudinal axis; and

said structure including at least one layer of fibers oriented at 90 degrees, or approximately at 90 degrees, with respect to the longitudinal axis that extends at least over said large diameter bending zone and that is spaced from the butt.

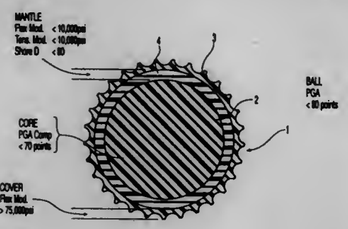
5,813,923
GOLF BALL

Christopher Cavallaro, Attleboro; Murali Rajagopalan, South Dartmouth, both of Mass.; Samuel A. Pasqua, Jr., Bristol, R.I.; Herbert C. Boehm, Norwell, and Kevin M. Harris, New Bedford, both of Mass., assignors to Acushnet Company, Fairhaven, Mass.

Continuation-in-part of Ser. No. 482,522, Jun. 7, 1995, Pat. No. 5,688,191, and a continuation-in-part of Ser. No. 603,057, Feb. 16, 1996, Pat. No. 5,759,676, and a continuation-in-part of Ser. No. 606,373, Feb. 23, 1996, Pat. No. 5,721,304. This application Aug. 30, 1996, Ser. No. 706,008

Int. Cl.[6] A63B *37/06;37/12*

U.S. Cl. 473—373 **19 Claims**



1. A golf ball comprising:

(a) a core having a PGA compression less than 70 points;

(b) a cover layer having a flexural modulus of greater than 75,000 psi; and

(c) a molded mantle layer disposed between the core and cover layer, wherein the mantle layer has a flexural modulus of less than 10,000 psi.

5,813,924
GOLF BALL

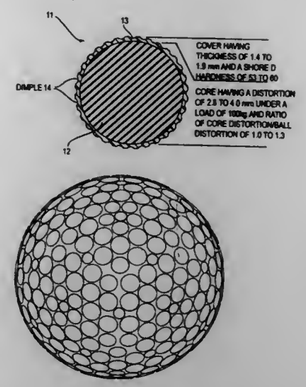
Hisashi Yamagishi; Yoshinori Egashira; Hideo Watanabe, and Atuki Kasasima, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 536,049, Sep. 29, 1995, Pat. No. 5,743,817. This application Jun. 18, 1997, Ser. No. 878,062

Claims priority, application Japan, Oct. 14, 1994, 6-276109; Dec. 14, 1994, 6-333024

Int. Cl.[6] A63B *37/06;37/12;37/14*

U.S. Cl. 473—377 **2 Claims**



1. A solid golf ball comprising a solid core and a cover having a plurality of dimples thereon wherein

the core has a distortion of 2.8 to 4.0 mm under a load of 100 kg,

the ratio of a core distortion (mm) under a load of 100 kg divided by a ball distortion (mm) under a load of 100 kg ranges from 1.0 to 1.3,

the cover has a thickness of 1.4 to 1.9 mm, and a Shore D hardness of 53 to 60,

said dimples are divided into at least three kinds of dimples which have different diameters each other,

each dimple has the ratio of diameter (mm) divided by depth (mm) of 18 to 27,

the value of the spatial volume of each dimple below a plane defined by an edge of the dimple divided by the volume of a cylinder wherein the bottom of said cylinder is defined by said plane and the height is determined by the maximum depth of the dimple from said plane ranges from 0.390 to 0.550, and

the total number of said dimples is in the range of 390 to 450.

5,813,925
APPARATUS FOR PRACTICING SLIDING INTO A BASEBALL BASE AND METHOD OF USE

Winston B. Lewy, 6371 Adelaide Pl., Los Angeles, Calif. 90042

Filed May 6, 1997, Ser. No. 852,132

Int. Cl.[6] A63B *69/40*

U.S. Cl. 473—430 **12 Claims**

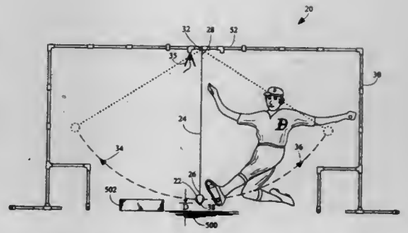
1. An apparatus for practicing sliding into a baseball base, comprising:

a baseball;

a tether having a first end and an opposite second end;

a support structure having a connection point;

said end of said first tether connected to said baseball; and,



said second end of said tether connected to said first connection point so that said first baseball is suspended between approximately one and six inches above.

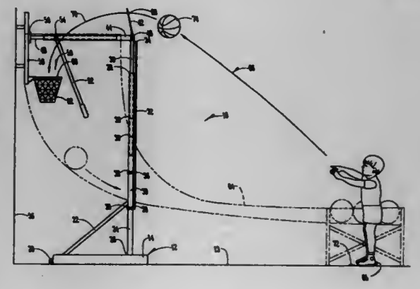
5,813,926
METHOD AND MEANS FOR PRACTICING FREE THROWS

William A. Vance, 122 S. Main, Box 282, Hazleton, Iowa 50641

Filed Jun. 27, 1997, Ser. No. 883,864

Int. Cl.[6] A63B *69/00*

U.S. Cl. 473—448 **9 Claims**



1. A basketball free throw shooting training device, comprising,

a frame having a top horizontal bar,

support means for supporting said frame on a horizontal floor surface,

said support means including means for raising and lowering said horizontal bar,

a pair of upstanding closely spaced guide bars extending upwardly from said horizontal bar and having a horizontal space therebetween sufficiently wide to permit a basketball to freely pass therethrough, whereby said frame can be placed between an elevated horizontal basketball rim and a predetermined free throw line to permit a player to shoot a basketball from the location of such line over said horizontal bar and between said guide bars in an arched path so that the shot ball will reach the apex of its trajectory after passing over said crossbar towards said rim,

an adjustable measuring arm secured to said frame to permit said frame to be positioned from a basketball backboard assembly a predetermined distance.

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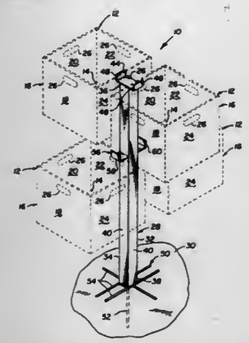
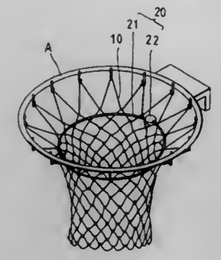
5,813,927
DEVICE USED TO SUPPORT BASEBALLS DURING BATTING PRACTICE
James H. Anglea, Arlington, Tex., assignor to Anglea Turf Concepts, Inc., Arlington, Tex.
Filed Sep. 27, 1995, Ser. No. 534,282
Int. Cl.[6] A63B *69/00*
U.S. Cl. 473—451 **6 Claims**



1. A device to support baseballs used by a pitcher during batting practice, comprising: container means for supporting a quantity of baseballs; an upright support means for supporting said container means above a baseball field, said upright support means including an elongated member having a first end and a second end, the first end being disposed away from the second end by a distance sufficient to position said container means above the baseball field for the pitcher to retrieve a baseball from said container means without bending; detachable connecting means for detachably connecting said container means to said upright support means, said detachable connecting means including first and second L-shaped members connected to and on diametrically opposed sides at the first end of the elongated member of said upright support means, third and fourth L-shaped members connected to and on diametrically opposed sides of said upright support means intermediate of the first and second ends, and the third L-shaped member being disposed substantially equidistant between the first and second L-shaped members and the fourth L-shaped member being disposed substantially equidistant between the second and first L-shaped members; and said container means including a carton for the first, second, third and fourth L-shaped members, each carton having a bottom, a plurality of sidewalls extending upwardly from the bottom, and connected to the bottom and to one another, and at least one of the plurality of sidewalls defining an opening through which a portion of the L-shaped members is passed and through which an individual can extend a portion of a hand to grasp the sidewall; and the third and fourth L-shaped members being connected to said upright support means at a distance away from the first and second L-shaped members sufficient to receive the cartons for the third and fourth L-shaped members without contact with the cartons for the first and second L-shaped members; and anchor means connected to said upright support means for securing said upright support means at a location permitting the pitcher to retrieve a baseball from said container means to throw during batting practice.

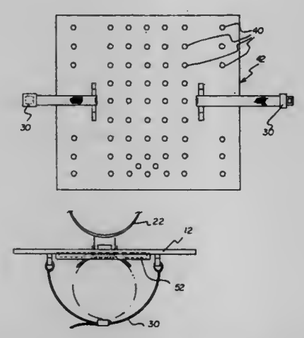
5,813,928
BALL BASKET
Frank Hsieh, 9th-1 Floor, Kuang Fu South Road, Taipel, Taiwan
Filed Dec. 18, 1996, Ser. No. 769,134
Int. Cl.[6] A63B *63/08*
U.S. Cl. 473—480 **5 Claims**

1. A ball basket comprising:
an attachment loop fastened with a goal frame;



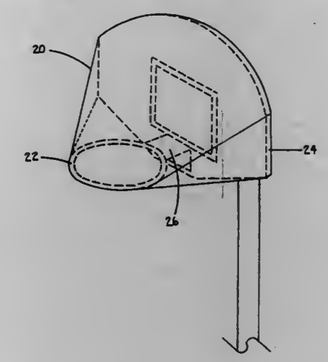
a net formed of a plurality of loosely woven cords and meshes formed by said woven cords, said net fastened at one end thereof with said attachment loop such that said net is composed of one segment proximal to said attachment loop, another segment distal to said attachment loop, and a junction located between said one segment and said another segment such that said junction has a diameter greater than the diameter of a ball, and that said junction is provided with a connection string fastened therewith; and
a sensing unit fastened with said connection string of said junction of said net and provided with a sensing body housing therein an electronic member, said electronic member being composed of an oscillatory power switch and an audio-photo element capable of bringing about an audio-photo effect at such time when said oscillatory power switch is turned on by an impact of the ball making contact with said sensing body.

5,813,929
PORTABLE HOOP AND BACKGROUND ASSEMBLY
Matthew Tobin, 4526 Boone St., Philadelphia, Pa. 19128
Filed Dec. 16, 1996, Ser. No. 767,215
Int. Cl.[6] A63B *63/02*
U.S. Cl. 473—485 **7 Claims**



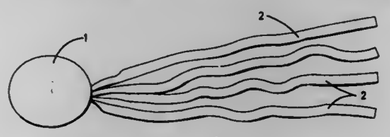
1. A portable hoop and background assembly comprising:
a backboard;
a rim disposed from a front of said backboard;
a net coupled to said rim;
strapping means attached to a back of said backboard;
wherein the rim of said net is collapsible;
a plurality of bendable protrusions positioned on said back of said backboard; and
wherein said plurality of bendable protrusions are made of rubber or plastic.

5,813,930
BASKETBALL HOOP AND BACKBOARD COVER AND SYSTEM
Aaqil Strauther, 4441 Belcher Ct., Columbus, Ohio 43224-5307
Filed Feb. 26, 1997, Ser. No. 807,802
Int. Cl.[6] A36B *63/08*
U.S. Cl. 473—485 **19 Claims**



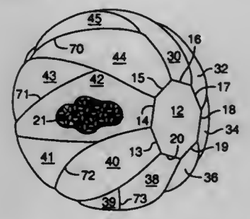
1. A basketball hoop and backboard cover for covering a basketball hoop when it is attached to a backboard, comprising:
a cover having a hood portion and a skirt portion;
means for suspending the cover above the basketball hoop, wherein the hood portion of the cover is draped over the backboard and the skirt portion is placed around the basketball hoop, and wherein the hood and skirt portions are secured at the back side of the backboard.

5,813,931
BALL AND TAIL
Ian Gavin Gormley, Durban, South Africa, assignor to European Sports Merchandising BV, Amsterdam, Netherlands
Filed Jul. 18, 1997, Ser. No. 896,529
Claims priority, application South Africa, Jul. 19, 1996, 96/6143
Int. Cl.[6] A63B *43/02*
U.S. Cl. 473—575 **8 Claims**



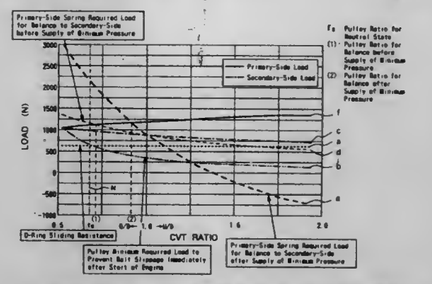
1. A combination ball and tail characterized in that the ball has
a minimum bounce height, when fitted with its tail, of at least about 50 cm (19.7 inches) when dropped 254 cm (100 inches) upon a smooth flat horizontal concrete base,
and a minimum bounce height, without its tail, of at least 80 cm (31.5"),
a diameter of between 20–100 mm (1 to 4"),
a mass of between about 2 g and 75 g(0.3 to 2.6 oz),
a relative density no greater than about 0.5,
an Air Penetration Factor no greater than 1.0, (ratio of weight in grams to the frontal area of the ball in square centimeters),
and the tail has
one or more lengths of flexible material attached to the ball,
a flexibility rating of between 20 mm (0.8") and 100 mm (3.9")
a minimum length of not less than three times the diameter of the ball and a maximum length of 1.2 m (47"),
the weight of the tail outside the ball is not more than 20% of the weight of the ball without the outside part of the tail attached,
a thickness of material of less than 0.1 mm (0.004").

5,813,932
GAME FOOTBAG HAVING IMPROVED SKIN AND FILLER
Charles E. Grafton, 1612 Fair Oaks Avenue, S. Pasadena, Calif. 91030
Filed Aug. 19, 1997, Ser. No. 914,549
Int. Cl.[6] A63B *37/02*
U.S. Cl. 473—594 **12 Claims**



1. A game footbag having a low rebound characteristic, said game footbag comprising:
a generally spherical flexible outer skin having a pair of multi-faceted end caps oppositely positioned and a plurality of mutually joined longitudinal panels each having opposed ends joined to one of said facets on each of said end caps, each of said longitudinal panels being formed of a pair of complementary panel segments having convexly curved sides, a straight edge joining said facet of said end cap and an angled edge joined to the angled edge of its complementary panel segment; and
a quantity of filler formed of a plurality of generally rounded slick-surfaced pellets.

5,813,933
CONTINUOUSLY VARIABLE TRANSMISSION WITH BIAS SPRINGS ON THE DRIVE AND DRIVEN PULLEYS FOR SETTING A PREDETERMINED SPEED RATIO WHEN THE CUT IS IN NEUTRAL
Kazumasa Tsukamoto, Toyota; Takeshi Inuzuka; Masashi Hattori, both of Anjo, and Takashi Furuya, Chiryu, all of Japan, assignors to Aisin AW Co., Ltd., Japan
Filed Dec. 26, 1996, Ser. No. 774,705
Claims priority, application Japan, Dec. 26, 1995, 7-339713
Int. Cl.[6] F16H *9/26*
U.S. Cl. 474—11 **7 Claims**



1. A continuously variable transmission for a vehicle comprising:

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an input shaft for being drivingly connected to an engine output shaft;

an output shaft for being drivingly connected to a wheel of the vehicle;

a belt-type continuously variable transmission apparatus having a first pulley drivingly connected to said input shaft, a second pulley provided on the side of said output shaft, a belt extending around the first and second pulleys, and axial force applying means for applying variable axial force to the pulleys to control a pulley ratio; and

a planetary gear having a first rotary element connected to said input shaft, a second rotary element connected to said second pulley, and a third rotary element connected to said output shaft so that by changing the pulley ratio the variable transmission achieves a forward drive state, a neutral state, and a reverse drive state of the vehicle;

said axial force applying means including first constant urging means for applying a first axial urging force to said first pulley, and second constant urging means for applying a second axial urging force to said second pulley, and

said first and second axial forces being set such that the pulley ratio is urged to a pulley ratio r_1 within a predetermined range of a pulley ratio r_N where the variable transmission is in said neutral state.

5,813,934

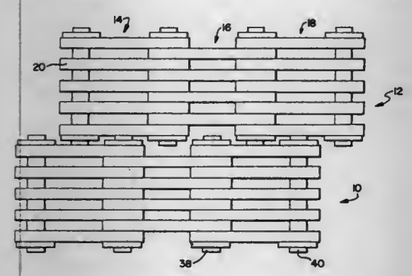
PHASED CHAIN ASSEMBLY WITH CHAIN AND SPROCKET OF UNMATCHED PITCH

Mark E. Patton, Dryden, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Nov. 9, 1995, Ser. No. 554,929

Int. Cl.[6] F16H *7/00*

U.S. Cl. 474—84 **12 Claims**



1. A phased chain and sprocket assembly, comprising:

first and second driving sprockets connected to a single drive shaft, said first and second driving sprockets having a plurality of spaced teeth, said driving sprockets being disposed in parallel relationship along said drive shaft,

first and second driven sprockets connected to a single driven shaft, said first and second driven sprockets having a plurality of spaced teeth, said driven sprockets being disposed in parallel relationship along said driven shaft,

said drive shaft being operatively connected to a power input and said driven shaft being operatively connected to a power output,

said first driving sprocket being aligned with said first driven sprocket and having a first chain assembly drivingly connecting said first driving sprocket with said first driven sprocket, said second driving sprocket being aligned with said second driven sprocket and having a second chain assembly drivingly connecting said second driving sprocket with said driven sprocket,

said first and a second chain assemblies having a plurality of interleaved rows of inverted tooth links, said links being adapted to contact the teeth of at least one of said sprockets,

pivot pins connecting adjacent rows of links, each link defining apertures for receiving said pivot pins,

said links of said first chain assembly being constructed and arranged so that said successive rows of said links of said first chain assembly initially contact every other tooth of said first driving sprocket as said rows of said links of said first chain assembly enter said driving sprocket, said pivot pins of said first chain assembly being longitudinally offset with respect to said pivot pins of said second chain assembly.

5,813,935

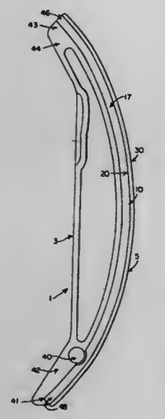
CHAIN GUIDE WITH EXTRUDED WEAR FACE

Stanley K. Dembosky, Ithaca; J. Christian Haesloop, Rock Stream, and Bradley F. Adams, Homer, all of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Jul. 23, 1996, Ser. No. 685,417

Int. Cl.[6] F16H *7/08*

U.S. Cl. 474—111 **10 Claims**



1. A guide for a power transmission chain, comprising:

a carrier portion and a slide portion,

said slide portion being formed of polymer material and being manufactured by an extrusion molding process wherein the polymer material is forced through an orifice having a predetermined profile while the material is in a molten state,

said carrier portion and slide portion having complementary profiles to allow said slide portion to be inserted along said carrier portion and moved to a stopped position along said carrier portion, said complementary profiles acting to prevent relative movement of said carrier portion with respect to said slide portion after assembly in said stopped position.

5,813,936

DRIVING FORCE CONTROLLER IN VEHICLE FOR FORCIBLY UPSHIFTING IN RESPONSE TO A DRIVING FORCE TRACTION CONTROLLER AND A VEHICLE STOPPED DETECTION MEANS

Yutaka Kichima; Shinichi Inagawa, and Hiroshi Ikegami, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

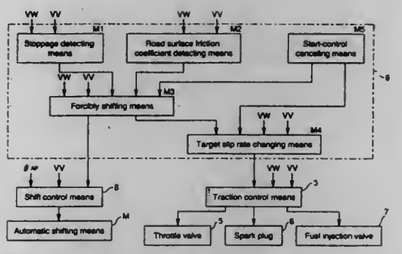
Filed Mar. 14, 1997, Ser. No. 818,065

Claims priority, application Japan, Mar. 15, 1996, 8-058648

Int. Cl.[6] B60K *28/16;* **F02D** *29/02*

U.S. Cl. 477—97 **3 Claims**

1. A driving-force controller in a vehicle, comprising:



shift control means for controlling shifting of a gear shift stage of an automatic transmission according to a previously set shifting pattern; and

traction control means for decreasing a driving force for the vehicle to converge a slip rate of driven wheels into a target slip rate, when slippage of said driven wheels is detected,

wherein said driving-force controller includes a stoppage detecting means for detecting stoppage of the vehicle, a road surface friction coefficient detecting means, responsive to the slippage of said driven wheels for detecting a slippery road surface and a forcibly shifting means for forcibly shifting the gear shift stage of said automatic transmission to a second gear shift stage when said stoppage detecting means detects the stoppage of the vehicle, after said road surface friction coefficient detecting means detects a slippery road surface.

5,813,937

EPICYCLIC CHANGE SPEED GEAR HUBS

Stephen Terence Rickels, Nottingham, United Kingdom, assignor to Sturmey-Archer Limited, Nottingham, United Kingdom

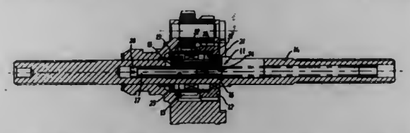
PCT No. PCT/GB94/00394, § 371 Date Dec. 26, 1995, § 102(e) Date Dec. 26, 1995, PCT Pub. No. WO94/20358, PCT Pub. Date Sep. 15, 1994

PCT Filed Feb. 28, 1994, Ser. No. 513,785

Claims priority, application United Kingdom, Mar. 2, 1993, 9304189

Int. Cl.[6] B62M *11/16;* **F16H** *3/66*

U.S. Cl. 475—297 **4 Claims**



1. An epicyclic change speed gear comprising a fixed spindle, an input member and an output member, planet pinions disposed in a planet cage which is operatively connected to one of the output member and the input member, a gear ring which is operatively connected to one of the output member and input member, a clutch operative to connect the input member to one of the planet cage and input member to the gear ring, axially movable sun pinions which are resiliently loaded into abutting side-to-side disposition and are rotatable on the spindle, one of the sun pinions being operable to provide a reaction member when locked to the spindle and a gear selector key disposed radially inwardly of the sun pinions and adapted for selective cooperative engagement with one of the sun pinions on movement of the selector key in the axial direction of the hub in order to lock the corresponding sun pinion to the spindle to provide the reaction member, the selector key including a support rod, first and second body parts mounted on the rod for limited relative movement in the axial direction thereof, and resilient means resisting the relative movement, wherein the key further controls the operative condition of the clutch and thereby the connection of the input member to one of the planet cage and the gear ring.

5,813,938

WHEEL MOUNTING HUB SYSTEM

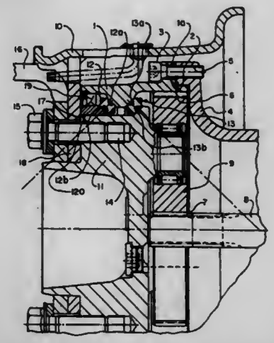
Franz Forster, Karlstadt-Mühlbach, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Mar. 15, 1996, Ser. No. 617,500

Claims priority, application Germany, Mar. 20, 1995, 195 10 035.2

Int. Cl.[6] F16H *1/36*

U.S. Cl. 475—331 **19 Claims**



1. A wheel mounting hub system including a hollow stationary hub carrier having an inner surface and a rotating hub having an outer surface, a planetary gear train located within said hollow stationary hub carrier and including a plurality of planet gears and a sun gear, a plurality of webs formed on said rotating hub supporting said planet gears in said planetary gear train, said planetary gear train including a ring gear on said inner surface of said hollow stationary hub carrier, axially spaced annular roller bearings located between said outer surface of said rotating hub and said inner surface of said hollow stationary hub carrier, and outer bearing races for said annular rolling bearings formed on said inner surface of said hollow stationary hub carrier, wherein said rotating hub is located radially within said hollow stationary hub carrier throughout at least a portion of its axial length, and said annular roller bearings and said planetary gear train are located axially adjacent to one another including an inner bearing race for one of said annular roller bearings on said outer surface of said rotating hub, an inner raceway member non-rotationally mounted on said outer surface of said rotating hub and a bearing race for another of said annular roller bearings on said inner raceway member, wherein said inner raceway member has a distal end in contact with a disc of a wheel rim connected to said rotating hub by fastening bolts.

5,813,939

VEHICLE DRIVE SYSTEM INCLUDING A TORQUE SPLITTER

Hiroshi Masumoto; Sunao Ishihara, and Shinji Ohkuma, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1997, Ser. No. 828,980

Claims priority, application Japan, May 23, 1996, 8-151514

Int. Cl.[6] B60K *17/00*

U.S. Cl. 477—35 **7 Claims**

1. A vehicle drive system including a torque splitter for distributing an output of a vehicle engine to a pair of output shafts, comprising:

a differential gear device including an input element and a pair of output elements;

engaging means for selectively engaging one of said output elements with a component of said differential gear device so as to increase or decrease a rotational speed of one of said output elements over the other output element;

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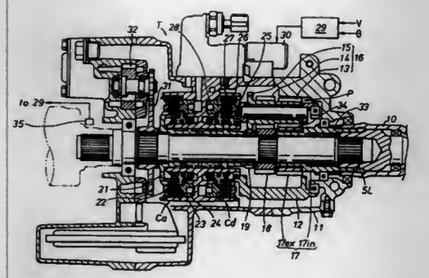


detecting means for detecting a difference in rotational speed between said two output elements;

power control means for controlling a power output of said vehicle engine; and

a control unit which reduces a power output of said vehicle engine when said detected rotational speed difference is greater than a prescribed threshold level.

5,813,940

TRANSMISSION CLUTCH CONTROL ARRANGEMENT

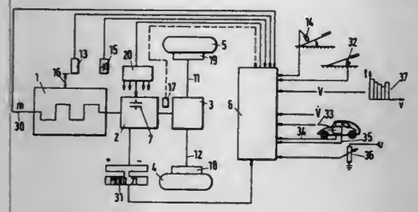
Norbert Ramm, and Frank Zimmermann, both of Braunschweig, Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Apr. 29, 1997, Ser. No. 841,116

Claims priority, application Germany, May 23, 1996, 196 20 742.8

Int. Cl.[6] B60K *23/02*

U.S. Cl. 477—93 **21 Claims**



1. A method for controlling engagement of a clutch to which engagement pressure is applied in the transmission of a drive system for a motor vehicle which includes a body, drive wheels, a drive system including an automatic transmission containing a clutch transmission, a control system and an arrangement for generating a signal representing at least one of: (a) a torque bias between a component of the drive system and the vehicle body; (b) a displacement distance between the drive system and the vehicle body; (c) an output torque of the transmission; and (d) a supporting force in the support bearings of a component of the drive system, and supplying the signal to the transmission control system comprising:

setting the control pressure on the clutch in the transmission (a) when the motor vehicle is in a stationary state, a gear is engaged and driven wheels are braked, or (b) when the motor vehicle in a stationary state with no gear engaged, or (c) when the motor vehicle is decelerating to a standstill with a gear engaged and when the vehicle speed and load are below specified thresholds as a function of the torque bias in such a way that, when a preselected clutch slip torque value is exceeded, the clutch begins to slip;

wherein the preselected value for the clutch slip torque is determined as a function of a prehistory of the vehicle operation during a limited period in the form of an evaluation of an immediately preceding vehicle speed profile.

5,813,941

MANUAL SHIFT CONTROL DEVICE OF A TRANSMISSION CONTROL SYSTEM FOR AN AUTOMOTIVE AUTOMATIC TRANSMISSION

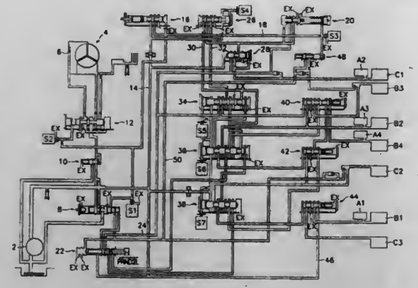
Jae Duk Jang, Kyunhki-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Jun. 13, 1996, Ser. No. 662,621

Claims priority, application Rep. of Korea, Jun. 14, 1995, 1995-15765

Int. Cl.[6] F16H *61/00*

U.S. Cl. 477—116 **4 Claims**



1. A manual shift control device of a transmission control system for an automotive automatic transmission, comprising:

a hydraulic pump for generating hydraulic pressure, the hydraulic pump being operated by the driving force of an engine;

a pressure regulator valve for regulating hydraulic pressure generated from the hydraulic pump in response to the vehicle's driving conditions;

a solenoid feed valve for feeding line pressure passing through the pressure regulator valve to first, second and third solenoid valves via line pressure passages;

a manual valve for feeding hydraulic pressure to a drive pressure passage in a drive "D" range and to a reverse pressure passage in a reverse "R" range while varying its ports in accordance with the position of a shift selector lever;

a torque control regulator valve for changing drive pressure fed from the manual valve into torque pressure in accordance with the duty-control of a third solenoid valve;

a control switch valve for alternately feeding torque pressure fed from the torque control regulator valve to first and second torque pressure passages in accordance with the ON/OFF operation of a fourth solenoid valve;

an N-D control valve for sequentially feeding torque pressure and drive pressure to a second friction member, which is applied at an initial shift operation together with a first friction member, to thereby alleviate shift shock occurring in a shift operation from a neutral range "N" to the drive range "D";

a first-to-second speed shift valve for feeding part of the torque pressure fed from the first and second torque pressure passages as well as part of the drive pressure fed from the manual valve to a third friction member through a second clutch valve while varying its ports in accordance with the ON/OFF operation of a fifth solenoid valve during a shift operation from the first speed to the second speed of the drive "D" range;

a second-to-third speed shift valve for feeding part of the torque pressure fed from the first-to-second speed shift valve as well as part of the hydraulic pressure fed to the third friction member to a fourth friction member through a third clutch valve while varying its ports in accordance with the ON/OFF operation of a sixth solenoid valve during a shift operation from the second speed to the third speed of the drive "D" range;

a third-to-fourth speed shift valve for feeding part of the torque pressure fed from the second-to-third speed shift valve as well as part of the hydraulic pressure fed to the fourth friction member through a fourth clutch valve and, at the same time, interrupting the hydraulic pressure feeding to the first friction member while varying its ports with the operation of a seventh solenoid valve during a shift operation from the third speed to the fourth speed of the drive "D" range, the third-to-fourth speed shift valve feeding drive pressure fed from the manual valve to the seventh friction member through the third and second clutch valves during a manual shift operation from the fourth speed of the drive "D" range to the second speed of a second "2" range;

an N-R control valve for feeding hydraulic pressure fed from the manual valve via the reverse pressure passage to a sixth friction member while varying its ports in accordance with the control of the third solenoid valve in the reverse "R" range; and

a shock alleviating means for absorbing shift shock by hydraulic pressure;

wherein the shock alleviating means comprises a first accumulator being controlled when the shift mode changes from the fourth speed of the drive "D" range to the second speed of the second "2" range as well as to the second speed of the drive "D" range, the fifth friction member is controlled, and hydraulic pressure is applied to the sixth friction member by the mechanical control.

5,813,942

APPARATUS FOR CONTROLLING AUTOMATIC TRASMISSION DURING DOWNHILL RUNNING OF VEHICLE BY CHANGING A REFERENCE ACCELERATION VALUE

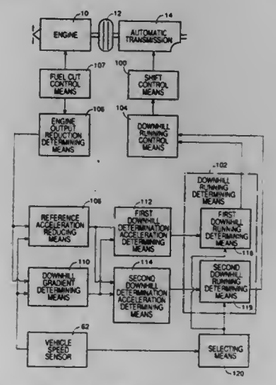
Masahiko Nakagawa, Nagoya, and Atsuo Okumura, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 1, 1997, Ser. No. 850,004

Claims priority, application Japan, May 10, 1996, 8-116512

Int. Cl.[6] F16H *61/02;61/10;61/16*

U.S. Cl. 477—120 **8 Claims**



1. A shift control apparatus for controlling a speed ratio of an automatic transmission of a motor vehicle having an engine and an accelerator pedal, during running of the vehicle on a downhill road, on the basis of an actual acceleration value of the vehicle as compared with a reference acceleration value of the vehicle, said shift control apparatus comprising:

engine output reduction determining means for determining reduction of an actual output of said engine with respect to a desired output of the engine as represented by an operating amount of said accelerator pedal; and

reference acceleration reducing means for reducing said reference acceleration value by a compensating amount which decreases with an increase in a running speed of the vehicle, if the engine output reduction determining means has determined the reduction of said actual output of the engine.

5,813,943

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

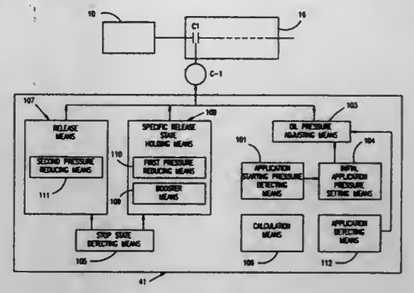
Yuuki Kousaka, Nishio; Masahiro Hayabuchi, Anjo; Yoshihisa Yamamoto, Nishio; Hiroshi Tsutsui, Anjo, and Yasuhiro Fujita, Hekinan, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed May 10, 1996, Ser. No. 644,890

Claims priority, application Japan, May 12, 1995, 7-115014

Int. Cl.[6] F16H *61/06*

U.S. Cl. 477—156 **13 Claims**



1. A control system for an automatic transmission which receives torque from an engine, comprising:

a speed change unit;

a clutch engagable, responsive to selection of a forward running range, to transmit the rotation of the engine to the speed change unit;

a hydraulic servo for applying/releasing said clutch responsive to an oil pressure; and

a control unit for controlling the oil pressure fed to said hydraulic servo, said control unit comprising:

application detecting means for detecting the application starting pressure received by the hydraulic servo at the instant when the application of said clutch is actually started;

initial application pressure setting means for setting an initial application pressure, as the oil pressure fed to the hydraulic servo, on the basis of the application starting pressure which is detected by said application detecting means; and

oil pressure adjusting means for adjusting the oil pressure fed to said hydraulic servo responsive to a change made in said forward running range, and for gradually raising the oil pressure fed to said hydraulic servo.

5,813,944

HAND-OPERATED SPEED CONTROL APPARATUS FOR ATTACHMENT TO A MOTOR VEHICLE

George R. Grindle, 1226 Wilma Lois, Pasadena, Calif. 77502

Filed Jan. 27, 1997, Ser. No. 791,436

Int. Cl.[6] B60K *41/20*

U.S. Cl. 477—209 **6 Claims**

1. A device for attachment to a motor vehicle to enable hand operation by a driver of said motor vehicle, said device comprising:

(a) a mounting bracket comprising a pair of parallel support plates and a transverse mounting shaft connecting said plates;

(b) a hand-operated lever having front and rear sides, said lever pivotly secured between said support plates by said mounting shaft, wherein said mounting shaft is seated within a corresponding transverse bore communicating through said lever between said front and rear sides;

(c) said hand-operated lever further including a proximal end for hand-contact by said driver and a distal end, said distal end further having a first flange extending perpendicularly from said front side and a second flange extending perpendicularly from said rear side in a direction opposite said first flange extension;

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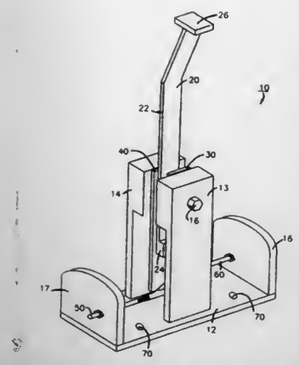


(d) an acceleration lever pivotly secured by said mounting shaft between said hand-operated lever and one of said support plates, and a brake lever pivotly secured by said mounting shaft between said hand-operated lever and a second of said support plates such that said hand-operated lever is positioned between said acceleration and brake levers, said acceleration and brake levers each having a transverse bore in registration and through which said mounting shaft is seated;

(e) said acceleration and brake levers each further including front and rear edges positioned in sufficient proximity to said hand-operated lever such that said first flange overlaps said front edge of said acceleration lever and said second flange overlaps said rear edge of said brake lever; and

(f) a first control cable secured at one end to said acceleration lever, said first control cable further extending to an acceleration assembly; and a second control cable secured at one end to said brake lever, said second control cable further extending to a brake system;

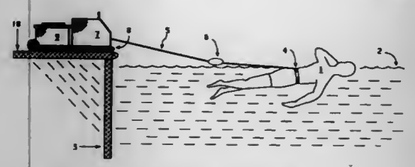
whereby when said hand-operated handle is rotated about said mounting shaft in a forward direction, said first flange contacts said front edge of said acceleration lever to pivotly move said acceleration lever rearward, thereby pulling said first control cable rearward to actuate said acceleration assembly; and whereby when said hand-operated handle is rotated about said mounting shaft in a rearward direction, said second flange contacts said rear edge of said brake lever to pivotly move said brake lever forward, thereby pulling said second control cable forward to actuate said brake system.

5,813,945

SWIM INSTRUCTION, TRAINING, AND ASSESSMENT APPARATUS

Robert H. Bernacki, P.O. Box 3188, Bloomington, Ind. 47402-3188

Filed Sep. 5, 1996, Ser. No. 708,644
Int. Cl.[6] A63B *31/00*
U.S. Cl. 482—5 **14 Claims**



1. A swim instruction apparatus comprising:

a cable having a proximal end and a distal end;

a harness for coupling the distal end of the cable to a swimmer in a body of water;

a motorized drum coupled to the proximal end of the cable for winding and unwinding the cable for applying forces to the cable;

a speed sensor coupled to the cable for generating an output signal proportional to a speed of the cable;

a first signal filter coupled to the speed sensor output for generating an output signal proportional to a short-term average speed of the cable and characterized by an averaging interval of at least one half of a swimming stroke interval in duration;

a speed controller coupled to the output of the filter, the speed controller generating a speed control output signal inversely proportional to the output signal of the first filter;

a force sensor coupled to the cable for generating an output signal responsive to a cable tension force;

a second signal filter coupled to the force sensor output for generating an output signal proportional to a short-term average force on the cable and characterized by an averaging interval of no more than approximately one half, but at least approximately one twentieth, of a swimming stroke interval in duration and no less than approximately a maximum cycle period of force variation attributable to characteristics of the motorized drum; and

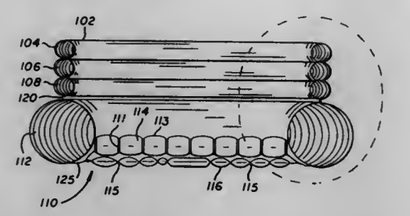
a force controller coupled to the speed controller output, the second signal filter output and to the motorized drum whereby the force controller controls the forces applied to the swimmer through the cable as the swimmer swims in the body of water in proportion to the output signal of the speed controller and inversely proportional to the output signal of the second signal filter, the applied forces being responsive to both interstroke variations in speed and intrastroke variations in force while being unresponsive to both variations in force attributable to characteristics of the motorized drum and variations in intrastroke speed.

5,813,946

INFLATABLE JUMPING TOY AND METHOD

Hua Hsiang Lin, Kowloon; Yaw-Yuan Hsu; Yu-Fu Hsiao, both of Fuzhou, all of Hong Kong, and Richard A. Saputo, Long Beach, Calif., assignors to Intex Recreation Corp., Long Beach, Calif.

Continuation-in-part of Ser. No. 45,210, Oct. 12, 1995, abandoned. This application Jul. 3, 1996, Ser. No. 674,620
Int. Cl.[6] A63B *5/11*
U.S. Cl. 482—27 **19 Claims**



1. An inflatable jumping toy comprising:

a torodial base tube for providing a base to a jumping toy;

retainer means vertically mounted on and connected to a top surface of said base tube for preventing accidental ejection from said jumping toy;

top bouncing means surrounded by and connected to a bottom surface of said base tube for providing impact absorption during use of said jumping toy; and

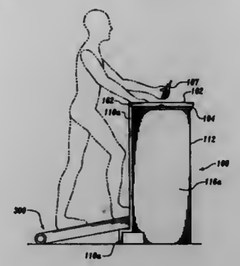
bottom bouncing means surrounded bv and connected to said bottom surface of said base tube for providing wear resistance to said jumping toy, wherein said top bouncing means and said bottom bouncing means each being separate from said retainer means.

5,813,947

EXERCISE DESK

Elnore A. Densmore, 111 Tower Pl., Seattle, Wash. 98109-3250

Filed Nov. 8, 1996, Ser. No. 748,474
Int. Cl.[6] A63B *22/02*
U.S. Cl. 482—51 **35 Claims**



1. An exercise desk that enables a person to exercise while carrying on another activity unrelated to exercising, comprising:

(a) an exercise device having a front and at least one force resisting movable part coupled thereto, said at least one movable part being adapted to receive force applied by the person when exercising in an upright position, said exercise device being selectively configured in a first state in which the exercise device is unusable for exercising and a second state in which the exercise device is usable for exercising;

(b) an enclosure having an opening on at least one side for receiving and storing said exercise device when the exercise device is in the first state, said enclosure being disposed adjacent to the exercise device when the exercise device is in the second state in which it is usable for exercising; and

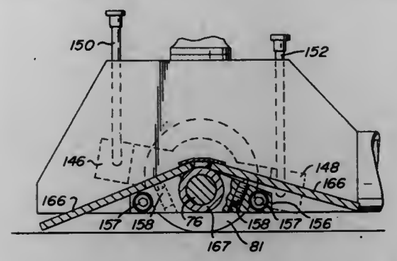
(c) a work surface comprising one side of the enclosure, said work surface being oriented so as to define an upper surface of the enclosure when the exercise device is in the second state, said enclosure disposed at the front of the exercise device being sized so that the upper surface is at a height that enables said upper surface to be adapted to support an article for use by the person when engaged in the other activity while exercising in the upright position and said upper surface thereby serving as the work surface.

5,813,948

WALKER

Robert T. Quigg, 118 Hickory Dr., and James A. Reynolds, 119 Hickory Dr., both of Hatfield, Pa. 19440

Filed Jan. 17, 1997, Ser. No. 785,202
Int. Cl.[6] A63B *22/00*
U.S. Cl. 482—67 **8 Claims**



1. A walker for supporting an elderly or disabled person, said walker comprising:

a four-sided height adjustable upper support frame;

a four-sided lower base frame coupled to said upper support frame and having a plurality of wheels attached thereto, wherein said four-sided lower base frame includes spring-loaded ramp means for assisting in access to the device by an individual confined to a wheelchair wherein said spring-loaded ramp means is biased to an upper position to keep it from touching the ground and which can be urged to touch the ground by force exerted upon said spring-loaded ramp; and

an adjustable seat assembly comprising:

a plurality of support straps suspended from said four-sided height adjustable upper frame;

adjustment means attached to said support straps for enabling the lengthening or shortening of the effective length of said support straps; and

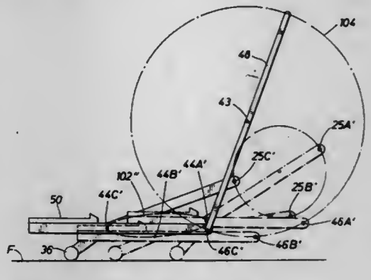
a set supported by said support straps.

5,813,949

STATIONARY EXERCISE APPARATUS HAVING A PREFERRED FOOT PLATFORM ORIENTATION

Robert E. Rodgers, Jr., Houston, Tex., assignor to CCS, LLC, Broomfield, Colo.

Continuation of Ser. No. 503,301, Jul. 17, 1995, Pat. No. 5,540,637, and a continuation-in-part of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,480. This application Jun. 18, 1996, Ser. No. 665,322
Int. Cl.[6] A63B *22/04;69/16*
U.S. Cl. 482—70 **30 Claims**



1. An apparatus for exercising comprising:

a frame having a base portion adapted to be supported by a floor;

first and second reciprocating members, each reciprocating member having a first end and a second end, a portion of said first and second reciprocating members adapted for substantially linear motion;

a coupling member having (i) a pulley supported by said frame defining a pivot axis, and (ii) means for attaching said second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in orbital movement of said second ends of said first and second reciprocating members about said pivot axis; and

means operatively associated with said reciprocating members for orienting the bottom of each foot of the user of the apparatus, said orienting means including first and second foot platforms and corresponding first and second predetermined reference planes so that during operation of the apparatus each said foot platform follows a substantially elliptical path having upper and lower halves and forward and rearward ends while said first predetermined reference plane remains substantially parallel with the floor as said first foot platform advances rearwardly proximate said forward and through at least a portion of the lower half of said elliptical path and said second predetermined reference plane remains substantially parallel with the floor as said second foot platform advances rearwardly proximate said forward end through at least a portion of the lower half of said elliptical path.

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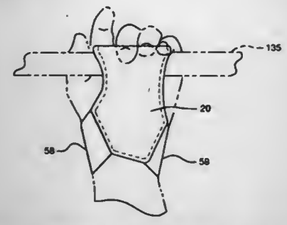
5,813,950
GRIP ASSIST APPARATUS
Michael S. Parker, HC 32 Box 200, Sorrento, Me. 04677
Continuation of Ser. No. 593,442, Jan. 29, 1996, abandoned. This application May 9, 1997, Ser. No. 853,808
Int. Cl.[6] A63B *21/00;* **A41D** *13/08*
U.S. Cl. 482—93 **20 Claims**



1. A grip assist apparatus for weight lifting to help support and strengthen a weight lifter's grip during weight training exercises comprising:

a non-slip gripping portion having a finger end, a thumbside wrist attachment end and a non-thumbside wrist attachment end, said gripping portion for covering a palm of a human hand from a plurality of fingers to below a wrist joint, said gripping portion having a variable width which corresponds to the shape of the palm and having a rigidity such that said gripping portion will not bend under its own weight and is thus self-supporting so that when said apparatus is fastened about the lifter's wrist and base of the hand, said gripping portion will stand up in front of the palm and tips of the fingers yet remain in close proximity to the palm and tips of the fingers, independent of the position of the lifter's hand, and wherein said gripping portion is sufficiently flexible to allow said gripping portion to be easily wrapped around a lifting bar using only the tips of the fingers of the human hand on which the apparatus is worn;

a wrist portion comprising a thumb flap and a non-thumb flap, each of said flaps having an attachment end and a free end, the attachment end of said thumb flap being attached to the thumbside attachment end of said gripping portion, the attachment end of said non-thumb flap being attached to the non-thumbside attachment end of said gripping portion, and

releasable fastening means, attached to said flaps, for securely fastening said flaps of said wrist and base of the hand of the lifter with the free ends of said flaps facing one another.

5,813,951
TOTAL BODY EXERCISING AND REHABILITATION WEIGHT LIFTING MACHINE AND METHOD
Harold Joseph Einsig, 3447 Aubrey Ave., Philadelphia, Pa. 19114
Continuation of Ser. No. 550,199, Oct. 30, 1995, abandoned. This application May 16, 1997, Ser. No. 857,969
Int. Cl.[6] A63B *21/06*
U.S. Cl. 482—97 **14 Claims**

1. An exercise and rehabilitation weight-lifting machine, comprising:

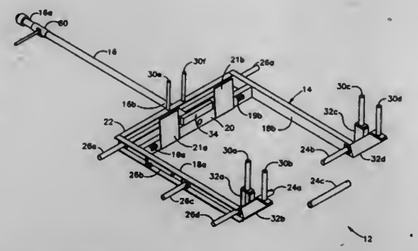
a support frame including a pair of anterior upright support members and a posterior upright support member;

a weight support member with an anterior end and a posterior end with an elongated extension at said posterior end with an elongated extension at said posterior end;

a front weight placement member on said anterior end of said weight support member for the placement of weights to provide a downward force component at said anterior end;

a front support member extending across said pair of anterior upright support members;

a vertically adjustable pivot device on said posterior upright support member;

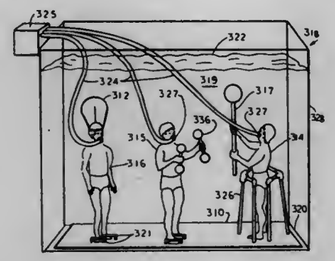


user force applicators on said weight support member for moving said weight support member against said downward force component;

said weight support member being pivotally supported at said posterior end by said pivot device for vertical, horizontal, longitudinal linear and longitudinally axial rotational movements; and

said weight support member supported at said anterior end by said front support member with said weight support member having a downward force component anterior of said user force applicators when weights are placed on said front placement member.

5,813,952
UNDER WATER EXERCISE DEVICES
Kenneth Lochbaum, 3002 E. 38th St., Erie, Pa. 16510
Division of Ser. No. 451,674, May 26, 1995, Pat. No. 5,611,763, which is a continuation-in-part of Ser. No. 365,498, Dec. 28, 1994, Pat. No. 5,533,950. This application Dec. 23, 1996, Ser. No. 772,420
Int. Cl.[6] A63B *21/008*
U.S. Cl. 482—111 **22 Claims**

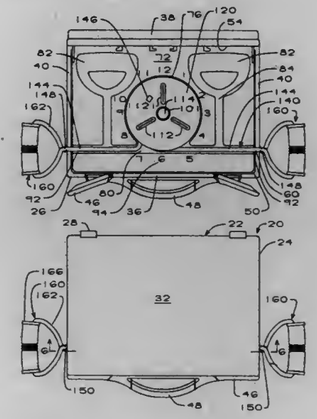


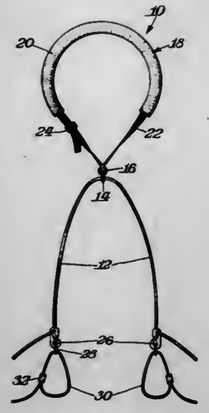
1. A deep water exercise pool having a bottom and side walls whereby a completely immersed exercising person can use an exercise device above his head without the device reaching the surface of the water while exercising;

a body engaging stabilizer means on said bottom of said pool to hold said person in place while exercising; and,

an air supply and a breathing means connecting the exercising person to said air supply, said air supply means supported adjacent said pool to supply air to the exercising person from outside said pool.

5,813,953
PORTABLE EXERCISE APPARATUS AND METHOD OF USE
David L. Whipple, 7129 San Francisco Rd. NE., Albuquerque, N. Mex. 87109
Filed Oct. 18, 1995, Ser. No. 544,849
Int. Cl.[6] A63B *21/055*
U.S. Cl. 482—123 **28 Claims**





1. An exercise apparatus, comprising:

container means;

cable storing means positioned within the container means;

elastic cable means attached to said storing means for movement between a stowed position within the container means and an exercising position having an outer portion outside the container means and an inner portion in the container means, said cable means remaining attached to the cable storing means in both said stowed and exercising position; and

means operable in said exercising position for permitting essentially only said outer portion to be alternately stretched and relaxed while said inner portion remains in substantially relaxed condition, thereby to enable exercises to be performed with said outer portion.

5,813,954
BUTTOCK EXERCISE DEVICE
William T. Wilkinson, P.O. Box 73, Salem, N.J. 08079, assignor to William T. Wilkinson
Continuation-in-part of Ser. No. 511,066, Aug. 3, 1995, Pat. No. 5,653,668. This application Nov. 18, 1996, Ser. No. 751,853
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—124 **19 Claims**

1. An exercise device which can be used for the buttock of a user comprising:

a) at least one elastic cord having two ends,

b) two separate foot loops each having a flexible foot contacting surface

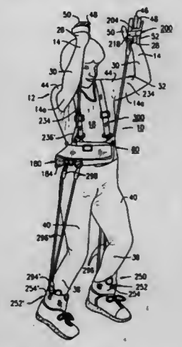
c) two attachment means which both are attached separately to said separate foot loops and to said elastic cord wherein one foot loop is connected to one end of said elastic cord and the other foot loop is connected to the other end of said elastic cord,

d) a connector which has a diameter greater than said elastic cord and said elastic cord fits inside said connector in a manner so that said elastic cord can move freely in said connector and the distance between each foot loop and connector being variable whereby as one foot loop is moved a distance further away from said connector, the other foot loop is moved the same distance closer to said connector,

e) a neck or shoulder piece; a pair of suspenders; a belt; a harness; or a vest which is connected to said connector, and

f) if a neck or shoulder piece is used said neck or shoulder piece comprises a band wherein said band forms a continuous loop, a portion of said loop is secured to the connector, which would be located at the front of the body portion of the loop and remote from the connector on said band is padding to provide a comfortable neck contact area at the back of the user's neck.

5,813,955
AEROBIC EXERCISE DEVICE
Thaddeus Edward Gutkowski, 702 Summit St., Linden, N.J. 07036, and Roland John Olney, 4 Victoria Grove, Ferny Creek, Victoria, Australia, 3786
Continuation of Ser. No. 567,531, Dec. 5, 1995, Pat. No. 5,647,827. This application Jul. 14, 1997, Ser. No. 891,900
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—124 **14 Claims**



1. An exercise device, comprising:

a) a belt assembly to be worn around the torso of the user including first and second layers formed of flexible plastic material;

b) said belt assembly further including a plurality of attachment means connected to said belt assembly and closure means for removably attaching said belt assembly to the torso of the user;

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c) a pair of hand assemblies each including a hand pad for engaging the palm of the user, said hand pad having finger holes through which the fingers of the user pass, a hand strap for removably attaching each hand assembly to a hand of the user, and an elastic hand resistance member having attachment means thereon for detachably connecting said hand assembly to one of the attachment means on said belt assembly; and

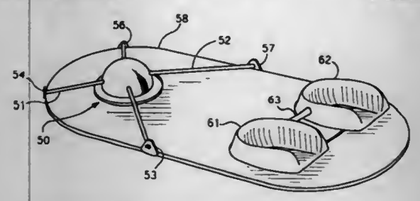
d) a pair of anklet assemblies each including an ankle wrap for removably attaching each anklet assembly to an ankle of the user, a foot strap for removably attaching each anklet assembly to a foot of the user, a heel strap for extending around the bottom of heel of the user and an elastic foot resistance member having attachment means thereon for detachably connecting said anklet assembly to one of the attachment means on said belt assembly.

5,813,956

SHOULDER EXERCISER

John F. Iams, Poway, and Robson L. Splane, Jr., Granada Hills, both of Calif., assignors to Superspine, Inc., Poway, Calif.

Division of Ser. No. 76,551, Jun. 11, 1993, Pat. No. 5,498,223.
This application Mar. 11, 1996, Ser. No. 613,369
Int. Cl.[6] A63B *23/02*
U.S. Cl. 482—129 **8 Claims**



1. A shoulder exerciser comprising:

a handpiece having a flat bottom portion for sliding on a surface of a door and an upper portion for receiving one or both hands of a user in a position adjacent to said surface of the door, said handpiece having a hollow cavity which can be filled with a fluid material to add weight to the handpiece to increase the force required to exercise the shoulder;

one or more resilient members attached to said handpiece; and

means for connecting said resilient member to the upper corners of the door so that said handpiece is moveable in any direction along said surface by a user to exercise the shoulder against the resistance of the resilient members.

5,813,957

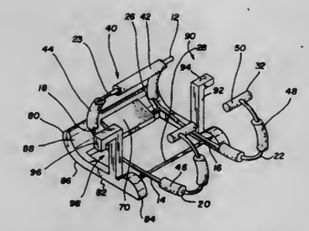
AQUATIC ABDOMINAL EXERCISER APPARATUS

Frank E. Rossiter, 208 National Union Blvd., Tuckerton, N.J. 08087

Filed Apr. 24, 1997, Ser. No. 842,217
Int. Cl.[6] A63B *23/02*
U.S. Cl. 482—140 **10 Claims**

1. A new and improved aquatic abdominal exerciser apparatus comprising, in combination:

an exerciser frame having a pair of side bars each having a central linear extent having a top end and a bottom end, a pair of bottom arcuate U-shaped extent having a first end integrally coupled to the bottom end of the associated linear extent and a second end curved upwardly to define a first radius of pair of top arcuate U-shaped extent having a first end integrally coupled to the top end of the associated linear extent and a second end curved upwardly to define a second radius of curvature less than the first radius of curvature, the exerciser frame further having a first cross bar integrally



coupled between the second ends of the top arcuate extents of the side bars, a second cross bar integrally coupled between the top ends of the linear extents of the side bars, and a third hollow crossbar coupled between the linear extents adjacent the bottom ends thereof, the exerciser frame further including a pair of separate handles integrally coupled in coaxial relationship with each other and in perpendicular relationship with the second ends of the bottom arcuate U-shaped extent;

a plurality of pads each having a generally cylindrical configuration including a first pad situated about the first cross-bar, a pair of second pads situated about the top arcuate U-shaped extents, a pair of third pads situated about the linear extents between the third cross bar and the bottom ends of the linear extents, a pair of fourth pads situated about the bottom arcuate U-shaped extents, and a pair of fifth pad situated about the handles of the exerciser frame;

a padded head rest having a rectangular configuration with a bottom surface thereof coupled to the second cross bar and residing within a plane defined by the linear extents of the side bars of the exerciser frame;

a support frame having a pair of linear side extents each with a front end and a rear end, a connector bar with an arcuate cross-section integrally connected between the rear end of each of the side extents and a pair of bath tub engagement portions including a vertical post integrally coupled to a central portion of the associated side extent, a horizontal arm integrally coupled at a top end of each vertical post and extended outwardly therefrom, and a downwardly extending containment portion integrally coupled to an outer end of only one of the horizontal arms thereby defining an inverted U-shaped hook for releasably coupling with a side wall of a bath tub, the third cross bar releasably and pivotally coupled between the front ends of the side extents thereby allowing the exerciser frame to pivot about an axis defined by the third cross bar;

an air cylinder having a first end pivotally coupled to the second cross bar of the exerciser frame and a second end pivotally coupled to the connector bar of the support frame, the air cylinder adapted to afford a predetermined amount of resistance to the relative movement of the support frame and exercise frame;

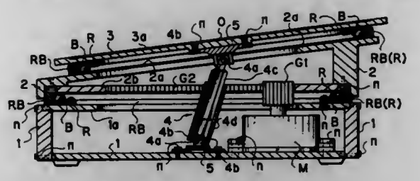
a floating support having a rectangular configuration with a short front portion, a short rear portion, and a pair of long side portions integrally coupled therebetween for defining a hollow interior, the floating support further including a first set of parallel spaced straps perpendicularly coupled to a bottom surface of the side portions adjacent the front portion of the floating support, a second set of parallel spaced straps perpendicularly coupled to the bottom surface of the side portions adjacent the rear portion of the floating support, a back rest pad having a rectangular configuration with a rear face coupled to the second set of straps, and a pair of retaining brackets each situated on opposite interior faces of the side portions, the retaining brackets are adapted to releasably receive ends of the third cross-bar therein thereby allowing the exerciser frame to pivot with respect to the floating support upon the floatation thereof.

5,813,958

ROCKING FOOT EXERCISER (FOOT ROCKER)

Hiroaki Tomita, 38-2, Minamiogikubo 2-chome, Tokyo, Japan

Filed Dec. 2, 1996, Ser. No. 756,920
Int. Cl.[6] A63B *22/14*
U.S. Cl. 482—146 **11 Claims**



1. A foot rocker comprising:

a stand case housing a motor and a universal joint;

a rotating disk attached to said stand case at a center thereof and being driven by said motor for rotation about said center relative to said stand case via a first bearing, said rotating disk comprising a flat lower surface plate facing said stand case and an inclined upper surface; and

a rocking plate attached to said universal joint and disposed on said inclined upper surface and positioned eccentrically relative to a center of said inclined upper surface of said rotating disk, said rotating disk rotating relative to said rocking plate via a second bearing whereby upon rotation of said rotating disk said rocking plate moves in a rocking and eccentrically orbital fashion relative to said stand case,

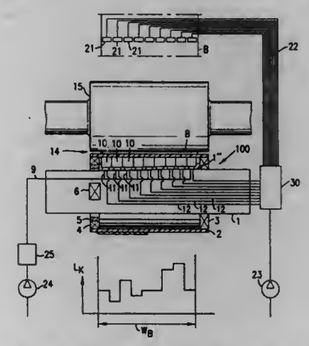
wherein at least one of said first bearing and said second bearing comprises a ring-shaped rail oriented in a plane substantially parallel to said flat lower surface plate and a rolling member concentrically engaged with said ring-shaped rail for movement about said rail in said plane.

5,813,959

ROLLER

Peter Hader, Kempen, and Klaus Kubik, Krefeld, both of Germany, assignors to Eduard Kösters Maschinenfabrik GmbH & Co. KG, Krefeld, Germany

PCT No. PCT/DE94/01037, § 371 Date Sep. 24, 1996, § 102(e) Date Sep. 24, 1996, PCT Pub. No. WO95/09309, PCT Pub. Date Apr. 6, 1995
PCT Filed Sep. 9, 1994, Ser. No. 619,597
Claims priority, application Germany, Sep. 27, 1993, 9314568 U
Int. Cl.[6] B23P *15/00*
U.S. Cl. 492—7 **10 Claims**



1. A roller for applying pressure to a strip of paper, textile, plastic film, sheet metal, or other similar material, said roller comprising:

a rotatable hollow roller having an inside circumference and an outside working roller circumference, said hollow roller comprising fiber-reinforced synthetic resin material, and said hollow roller extending along a longitudinal direction;

a cross-beam extending through the hollow roller in said longitudinal direction such that there is radial spacing between the cross-beam and the inside circumference of the hollow roller around said cross-beam, said cross-beam including ends non-rotatably mounted in external supports; and

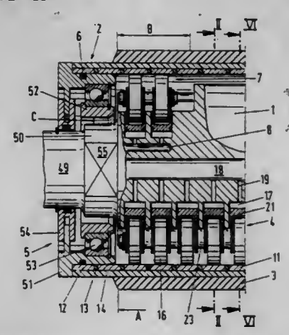
a plurality of hydrostatic support elements, arranged in one or more longitudinal rows on the cross-beam, said elements being arranged on a side of said cross-beam on which pressure is exerted by the roller on the strip, said elements being pressable against the inside circumference of the hollow roller by means of hydraulic fluid, said elements each having a contact surface pressable against the inside circumference of the hollow roller, said contact surface including open bearing pockets defined by edges, said pockets being fillable with hydraulic fluid for supporting the hollow roller, said pockets adapted to enable the hydraulic fluid to flow over the edges of the pockets to form a liquid film supporting the hollow roller, and wherein the support elements have a length not exceeding 20 cm in the longitudinal direction of the hollow roller, said elements being closely arranged with respect to each other in the longitudinal direction, and said elements being controllable independently of one another.

5,813,960

PRESS ROLL AND MACHINE WITH PRESS ROLL

Eugen Schnyder, Waltenschwil, Switzerland, assignor to De Pretto-Escher Wyss s.r.l., Schio, Italy

Filed Apr. 23, 1996, Ser. No. 636,372
Claims priority, application Switzerland, May 15, 1995, 01 300/95
Int. Cl.[6] B23P *15/00*
U.S. Cl. 492—18 **17 Claims**



1. A press roll with a controllable bending line comprising a fixed carrier, a roll jacket rotating around the carrier and a plurality of support elements, with the support elements being distributed in a row over the roll width surface in order to support the jacket in the region of a press position at the carrier, wherein the support elements include pneumatically loadable rollers.

5,813,961

INKING, WATER FORM AND METERING ROLLER

Ronald R. Buchwald, Lakeside, Oreg., assignor to Diamond Holding Corporation, Marietta, Ga.

Filed Sep. 1, 1995, Ser. No. 522,743
Int. Cl.[6] B21B *31/08*
U.S. Cl. 492—56 **14 Claims**

1. An inking, water form and metering roller, comprising:

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an elongated and generally cylindrical core composed of a first elastomeric material having a first durometer hardness, said core having a first end and a second end, a continuous sidewall extending from said first end to said second end, and a continuous helical groove defined in said sidewall and extending from said first end to said second end; and

a jacket composed of a second elastomeric material having a second durometer hardness, wherein said second durometer hardness is different from said first durometer hardness, said jacket fully enclosing said ends and said sidewall of said core, said jacket including an inner within said continuous helical projection that fits within said continuous helical groove of said core and a continuous smooth outer surface, such that said roller has a substantially smooth cylindrical exterior surface.

10. A water form and metering roller, comprising:

an elongated and generally cylindrical core composed of an elastomeric material having a predetermined durometer hardness, said core having a first end and a second end, and a continuous outer sidewall extending from said first end to said second end;

a continuous helical groove defined in said sidewall and extending from said first end to said second end; and

a ribbon composed of the same elastomeric material of which said core is composed, this elastomeric material having the same durometer hardness of said elastomeric material of said core, said ribbon being helically interwound within said groove and finished flush with said sidewall along the length of said core;

wherein said core and ribbon interact during usage to form a ridge therebetween which facilitates lateral movement of fluid evenly across said roller; and

wherein said durometer hardness of said core and ribbon promotes consistent wear characteristics between said core and ribbon to enhance the useful life of said roller.

5,813,962

FORGED ROLL FOR ROLLING A SEAMLESS STEEL PIPE

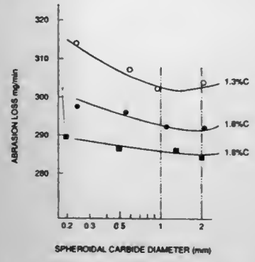
Taro Kanayama; Akira Yorifuji; Toshiaki Kasuya, all of Aichi; Yuichiro Sato, Toyama; Shoitsu Seo, Toyama, and Satoshi Matsuoka, Toyama, all of Japan, assignors to Kawasaki Steel Corporation, and Pacific Steel Mfg. Co., Ltd., both of Japan

Filed Jun. 24, 1997, Ser. No. 881,231

Claims priority, application Japan, Jun. 28, 1996, 8-170328

Int. Cl.[6] C22C *38/12*

U.S. Cl. 492—58 **16 Claims**



1. A forged roll for rolling a seamless steel pipe comprising a high carbon alloy cast steel metallurgical structure comprising about 1.10–1.85 wt % carbon, about 0.3–1.2 wt % silicon, about 0.4–1.5 wt % manganese, about 0.5–2.0 wt % nickel, about 0.5–2.0 wt % chromium and the remaining portion substantially iron,

said roll comprising a multiplicity of particles of a spheroidal carbide dispersed in the matrix of said roll, said particles having an average diameter of about 1 to 2 μm,

said roll having a surface wherein said spheroidal carbide particles cover about 35–55% of the area of said roll metallurgical structure.

5,813,963

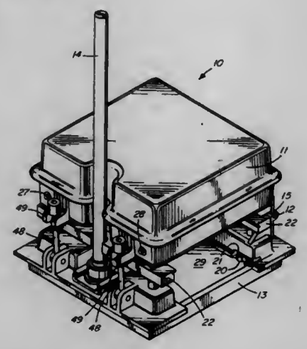
METHOD AND APPARATUS FOR ASSEMBLING ROE CONTAINERS

Arlen Jerome Erickson, Bainbridge Island, Wash., assignor to Fraser Box & Trading Co. Ltd., Surrey, Canada

Filed Dec. 29, 1995, Ser. No. 581,465

Int. Cl.[6] B67B *1/04;* **B31B** *1/90*

U.S. Cl. 493—102 **26 Claims**



1. A method of assembling a container lid to a body of a container and inserting a plug into an opening on the floor or lower panel of said container, said method comprising the steps of manually bringing the lid of the container into contact with the body of said container at at least one side of said lid and said container, positioning said container in an operating location and maintaining said container in said operating location during assembly of said lid to said container, applying pressure to said lid of said body of said container while simultaneously moving said plug from a plurality of plugs with a plug removal and plug insertion mechanism operably timed with said pressure application, and inserting said plug into said opening.

5,813,964

FORMING ROLLER OR SUPPORTING MATERIAL WEB USED IN LIQUID CONTAINER

Tatsumi Motomura, Ageo, Japan, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Continuation of Ser. No. 470,799, Jun. 6, 1995, abandoned. This application Jun. 3, 1997, Ser. No. 868,144

Claims priority, application Japan, Jun. 6, 1994, 6-148563

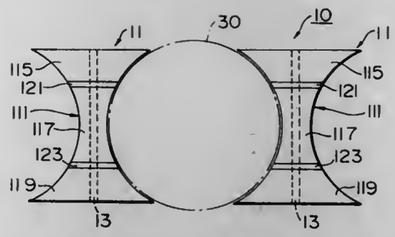
Int. Cl.[6] B65H *45/08;* **B65B** *9/06;9/10*

U.S. Cl. 493—302 **14 Claims**

1. A roller device for at least one of forming and supporting a packaging material web used for a liquid container, the roller device comprising:

at least one pair of opposing rollers, each of the at least one pair of opposing rollers having a shaft,

each of the at least one pair of rollers being divided into a plurality of independently rotatable roller portions by planes that are substantially perpendicular to the shaft, each of the plurality of independently rotatable roller portions having an outer peripheral surface curved relative to the shaft,



the outer peripheral surfaces of the plurality of independently rotatable roller portions of the at least one pair of rollers defining a generally complete circular surface, and

each of the plurality of independently rotatable roller portions being independently rotatable to have a generally uniform peripheral speed along the generally complete circular surface.

5,813,965

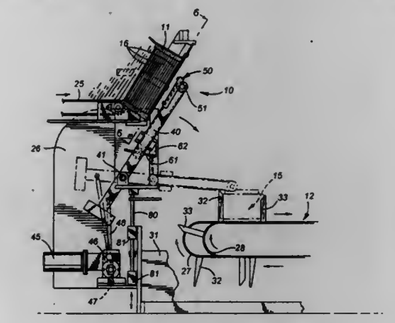
MACHINE FOR TRANSFERRING AND ERECTING CARDBOARD PACKAGE BLANKS

William R. Mitchell, and Thomas E. Brooker, both of Sarasota, Fla., assignors to Klockner Bartelt, Inc., Sarasota, Fla.

Filed Jun. 20, 1996, Ser. No. 667,089

Int. Cl.[6] B31B *1/80*

U.S. Cl. 493—315 **9 Claims**



1. A machine for picking cardboard blanks from a magazine which holds the blanks in a given orientation, opening them, and placing them on a conveyor, the machine comprising:

a pivoting arm having a pivot point, a servo drive at one end portion of the arm for pivoting the arm upwardly and downwardly about the pivot point, and a vacuum head rotatably mounted at the other end portion of the arm;

an intermittent drive on the pivot arm for controlling rotation of the vacuum head on the arm as the arm pivots;

said servo drive pivoting the pivot arm through a range of positions from a pick position in which the vacuum head is adjacent the magazine for picking a blank from the magazine, carrying the blank through a home position in which the vacuum head is disposed in parallel relation to the conveyor but is displaced thereabove, and to a final position in which the vacuum head deposits the blank on the conveyor, means engaging the blank while being carried by the vacuum head to unfold the blank so that the blank is unfolded when deposited on the conveyor, and means for controlling the intermittent drive to rotate the vacuum head from a first angle corresponding to the orientation of the blank in the pick position to a second angle in which the vacuum head is parallel to the conveyor in the home position, and for retarding the intermittent drive as the arm pivots the vacuum head from the home position to the final position, thereby to achieve a plunging motion of the vacuum head from the home position to the final position.

5,813,966

Patent Not Issued For This Number

5,813,967

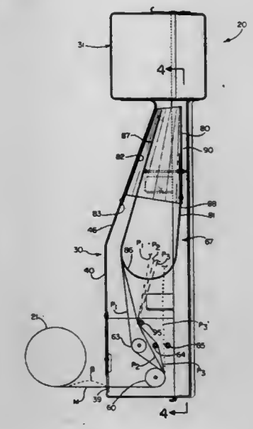
CUSHIONING CONVERSION MACHINE WITH GUIDE ROLLER, AND METHOD

Sandra K. Davila, Ashtabula, Ohio, assignor to Ranpak Corp., Concord Township, Ohio

Filed Feb. 25, 1997, Ser. No. 810,126

Int. Cl.[6] B31F *1/00;* **B65H** *45/00;* **B31D** *5/00*

U.S. Cl. 493—464 **23 Claims**



1. A method of converting a multi-ply sheet stock material into a cushioning product, comprising the steps of:

supplying the stock material from a roll thereof to a conversion assembly; and

using the conversion assembly to convert the stock material into a continuous three-dimensional strip of cushioning; and

wherein said supplying step includes:

passing the multi-ply stock material over a constant entry member;

passing the individual plies over respective laterally extending separator members between the constant entry member and the conversion assembly to separate at least two of the plies of the sheet stock material from one another, the separator members being arranged in a spaced relationship transverse to the generally planar extent of the plies passing from the constant entry member to the conversion assembly; and

passing at least the outer edges of at least one ply of the stock roll over a laterally extending guide member between the separator members and the conversion assembly such that the path of the outer edges of the ply is deflected, in a direction transverse to the generally planar extent thereof, from the path that the ply would otherwise follow if not guided over the guide member.

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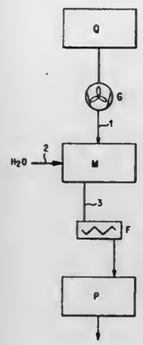
5,813,968

PROCESS FOR DISPOSING OF PERLITE WASTE

Frank Kunde, Wolfratshausen, and Franz Beck, Unterschleissheim, both of Germany, assignors to Linde Aktiengesellschaft, Hoellriegelskrueth, Germany

Filed May 22, 1996, Ser. No. 651,557
Claims priority, application Germany, May 22, 1995, 195 18 749.0
Int. Cl.[6] B09B *1/00;3/00*
U.S. Cl. 588—256 17 Claims



1. A process for disposing of perlite, comprising the steps of mixing the perlite with water which is essentially free of binders to obtain a perlite-water mixture and compressing the mixture to thereby substantially reduce the volume of the perlite.

5,813,969

PROCESS FOR DETOXICATING NOXIOUS WASTES

Toyohisa Eto, 10, Kitaminecho 3-chome, Oota-ku, Tokyo 145, and Masao Sugihara, 101, Fuyo House, 12-12, Minamiazabu 5-chome, Minato-ku, Tokyo 106, both of Japan

Division of Ser. No. 760,421, Dec. 4, 1996, Pat. No. 5,714,085.
This application Oct. 20, 1997, Ser. No. 954,203
Claims priority, application Japan, Jul. 10, 1996, 8-199617
Int. Cl.[6] A62D *3/00;* B09B *3/00*
U.S. Cl. 588—257 4 Claims

2. A process for detoxicating noxious wastes by admixing a detoxicating agent together with cement to noxious wastes containing heavy metals or PCB and eliminating noxious materials in the wastes, as well as solidifying them, in which said detoxicating agent comprises sodium, potassium, calcium, lithium, barium, magnesium, strontium, cobalt or nickel, copper and zinc contained in an ionic state to a diluted aqueous solution of a liquid comprising tannin and pyrolignous acid as the main ingredient.

5,813,970

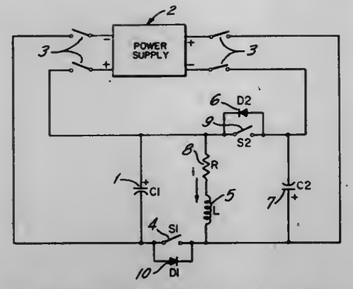
MEDICAL MAGNETOICTAL THERAPY

Richard S. Abrams, Vernon Hills, Ill., and Conrad M. Swartz, Greenville, N.C., assignors to Somatics, Inc., Lake Bluff, Ill.

Continuation-in-part of Ser. No. 986,429, Dec. 4, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 231,307
Int. Cl.[6] A61N *1/00*
U.S. Cl. 600—14 6 Claims

1. A method in medicine to purposefully induce a convulsive brain seizure in a human patient by a magnetic field to treat the patient's neuropsychiatric disorder, comprising:

positioning a magnetic induction coil proximate the head of the patient; and



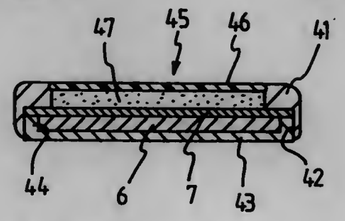
flowing a pulse train of electrical waveforms through the coil to produce a magnetic field to generate an electrical stimulus in the patient's brain to induce seizure.

5,813,971

MAGNOTHERAPY DEVICE

Nigel Broderick, Saltash, United Kingdom, assignor to Ecoflow Limited, United Kingdom

Filed Nov. 7, 1996, Ser. No. 744,969
Claims priority, application United Kingdom, Nov. 17, 1995, 9523513
Int. Cl.[6] A61N *1/00*
U.S. Cl. 600—15 10 Claims



1. A magnotherapy device comprising:

a housing of substantially plano-rectangular configuration having a contact surface adapted for positioning against a human or animal body, said housing comprising a top part and a bottom part, said top part comprising a substantially rectangular top wall having a pair of opposed end edges and a longer pair of opposed side edges, and two side walls depending from said pair of opposed side edges, said bottom part comprising a bottom wall and four side walls upstanding from said bottom wall, said side walls of said bottom being adapted to be received between said side walls of said top part, and said side walls and said bottom wall of said bottom part defining a well;

means for securing the housing to said human or animal body; and

magnetic field-producing means received in said well defined in said bottom part of said housing and arranged to successively present opposite magnetic poles to blood flowing through said human or animal body in a direction which is substantially parallel to said contact surface, said magnetic field-producing means producing a magnetic field strength of at least 150 gauss at a distance of 10 mm from said housing, and comprising a ferrous metal keeper plate and a plate magnet having opposite faces bounded by opposite edges, said opposite edges being disposed adjacent to said side walls of said bottom part, said plate magnet having first and second magnetic poles at said opposite faces thereof, said first magnetic pole being disposed adjacent to said contact surface and said second magnetic pole being disposed adjacent to said ferrous metal keeper plate, said keeper plate extending substantially

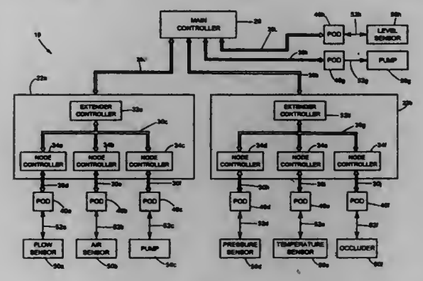
beyond said opposite edges of said plate magnet at said second face so as to produce said opposite magnetic pole effect at said contact surface.

5,813,972

MEDICAL PERFUSION SYSTEM WITH DATA COMMUNICATIONS NETWORK

Richard A. Nazarian, Golden Valley; Dirk R. Smith, St. Paul; James R. Watts, Woodbury, all of Minn.; Timothy J. Kriewall, Castle Rock, Colo., and Richard A. Griewski, Canton Township, Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 30, 1996, Ser. No. 723,504
Int. Cl.[6] A61M *1/00*
U.S. Cl. 600—17 15 Claims



13. A medical perfusion system for use in connection with the medical treatment of a patient, comprising:

a first type of perfusion device, said first type of perfusion device comprising a blood pump being adapted to pump blood through a fluid conduit connected to the patient;

a second type of perfusion device, said second type of perfusion device being adapted to sense a condition relating to the pumping of blood through said fluid conduit, said second type of perfusion device generating a sensing signal relating to said condition;

a data communications network for operatively interconnecting said first type of perfusion device and said second type of perfusion device;

means for transmitting messages in the form of digital data packets among said perfusion devices over said data communications network; and

a controller operatively coupled to said perfusion devices via said data communications network, said controller having an input device for accepting pump control commands relating to said blood pump from an operator,

wherein said data communications network has a plurality of network connectors and a network extender comprising:

a network connector adapted to be operatively coupled to one of said network connectors of said controller;

a plurality of extender connectors; and

a data bus electrically interconnecting said network connector of said network extender with each of said extender connectors.

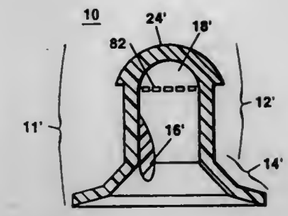
5,813,973

DEVICE AND METHOD FOR ALLEVIATING FEMALE URINARY INCONTINENCE

David Gloth, 16 Harcourt St., #61, Boston, Mass. 02116

Filed May 30, 1996, Ser. No. 641,160
Int. Cl.[6] A61B *19/00*
U.S. Cl. 600—29 62 Claims

1. A female urinary incontinence device comprising:



a resilient and at least partially flexible device body defining a cavity having an opening, said device body having an internal surface and an external surface; and

at least one urethra obstructing member attached to said device body, said urethra obstructing member being shaped to deform the urethra of a user's body and to cause the urethra to be substantially obstructed;

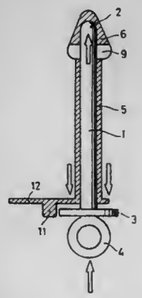
wherein when said urinary incontinence device is adapted to be positioned on the means of said user's body, at least partial compression of said device body produces a vacuum within said cavity sufficient to hold said urinary incontinence device onto said user's body.

5,813,974

DEVICE FOR WOMEN SUFFERING FROM INCONTINENCE

José Manuel Doladé Guardia, Castellnou,37, 1°, 1°, Barcelona, Spain

Filed Dec. 18, 1996, Ser. No. 769,154
Claims priority, application Spain, Dec. 19, 1995, 9503200
Int. Cl.[6] A61F *2/00*
U.S. Cl. 600—29 11 Claims



1. Device for women suffering from incontinence, comprising a cylindrical sleeve having an axial hole extending therethrough and provided, at one end, with a frustroconical-shaped end extension for abutting the neck of the bladder, wherein the end extension has transverse openings for communicating with the axial hole of the cylindrical sleeve, and having, at the opposite end, a removable plugging means for plugging the said axial hole, wherein the plugging means plugs the opposite end, at a lower end of the cylindrical sleeve, and the plugging means is formed by a projection of a resilient laminar extension of said lower end of the cylindrical sleeve, wherein the lower end is remote from the end extension which abuts the neck of the bladder; and

wherein the cylindrical sleeve also has a semi-rigid rod provided with a rounded end and with a flange and a holding grip at the other end, for the introduction of the cylindrical sleeve until the neck of the bladder has been abutted by the end extension.

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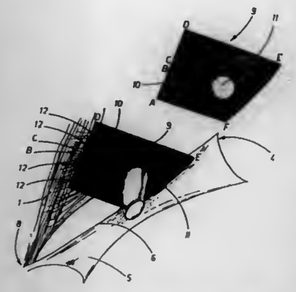
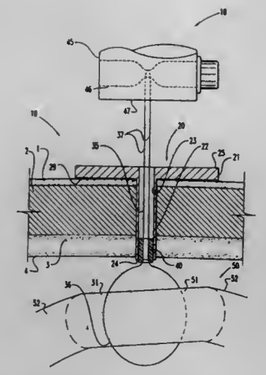
5,813,975
DOUBLE LAYER DYNAMIC PROSTHESIS FOR SURGICAL TREATMENT OF THE INGUINAL HERNIA
Gabriele Valenti, Via Nicola Fabrizi, 8, 1-00153 Roma, Italy
PCT No. PCT/IT95/00179, § 371 Date Jul. 8, 1996, § 102(e) Date Jul. 8, 1996, PCT Pub. No. WO96/14805, PCT Pub. Date May 23, 1996
PCT Filed Nov. 7, 1995, Ser. No. 669,471
Claims priority, application Italy, Nov. 9, 1994, RM94A0730
Int. Cl.[6] A61F *2/00*
U.S. Cl. 600—37 **5 Claims**



1. Double layer dynamic prosthesis for surgical treatment of inguinal hernia, made of a thin layer of prosthetic material, said prosthesis comprising:
a lower prosthetic layer and an upper prosthetic layer placed over said lower prosthetic layer, both said lower prosthetic layer and an upper prosthetic layer adapted to be independently mobile from each other and being fixed with first and second suture stitches to the musculoaponeurotic structures of the inguinal canal;
each prosthetic layer being fixed on only one side thereof, opposite to a single fixed side of the other layer;
said lower prosthetic layer and upper prosthetic layer determining between them an S-shape of the spermatic cord;
said lower prosthetic layer and upper prosthetic layer protecting the inguinal canal, in a coupled and complementary way, on a variable area so as to adapt to individual anatomic variations and modifications which occur in the patient during normal physical activity.

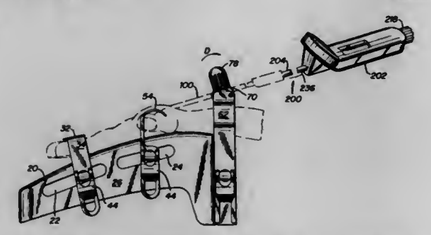
5,813,976
STABILIZING INSTRUMENTATION FOR THE PERFORMING OF ENDOSCOPIC SURGICAL PROCEDURES
Charles J. Filipi, 1328 N. 127th Ave., Omaha, Nebr. 68154, and Douglas A. Cornet, 3007 Frederick St., Omaha, Nebr. 68105
Filed Apr. 2, 1996, Ser. No. 627,731
Int. Cl.[6] A61B *1/00*
U.S. Cl. 600—102 **19 Claims**

1. A stabilized endoscope assembly for the performing of endoscopic surgical procedures within a gastrointestinal lumen, said assembly comprising:
an endoscopic, said endoscope having a distal end portion disposed within the gastrointestinal lumen of a patient for the performing of an endoscopic surgical procedure therein;
a percutaneous fixation catheter, said percutaneous fixation catheter including a distal tip portion, a proximal portion, and a catheter portion therebetween, said catheter portion defining a percutaneous lumen extending from said distal tip towards said proximal portion, said fixation catheter being percutaneously placed with said distal tip portion extending into the gastrointestinal lumen and with said proximal portion positioned outside of the patient;



a rigid mount, said rigid mount being fixed with respect to the operating environment; and
fixating means for fixedly attaching said endoscope relative to said rigid mount through said percutaneous lumen of said percutaneous fixation catheter substantially normal in relation to said catheter portion whereby said endoscope is stably fixed within the gastrointestinal lumen relative to the operating environment to thereby provide a stable platform for the performing of an endoscopic surgical procedure within the gastrointestinal lumen.

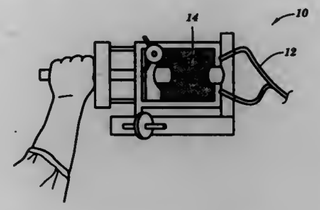
5,813,977
SURGICAL HAND SUPPORT APPARATUS
Peter W. J. Hinchliffe, New Haven; Dawn J. Pappalardo, Fairfield; Scott Larsen, Newtown; Ian J. Tovey, Milford, and Christopher McDonnell, Newtown, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Division of Ser. No. 319,853, Oct. 7, 1994, Pat. No. 5,547,463. This application Aug. 13, 1996, Ser. No. 696,418
Int. Cl.[6] A61B *1/06*
U.S. Cl. 600—183 **12 Claims**



1. A method of performing carpal tunnel surgery comprising:
placing a patient's hand in a hand support having a finger restraint and a thumb restraint, and a latch mechanism associated with each of the finger and thumb restraints, the hand support including a supporting surface for supporting the patient's hand and defining a longitudinal axis and a vertical axis;
adjusting the finger and thumb restraints in a general longitudinal direction and a general vertical direction to accommodate the patient's hand;
securing the finger and thumb restraints in a desired position by adjusting the latch mechanisms associated therewith;
providing a catheter and a guiding instrument, the catheter having an inflatable balloon and a check valve in fluid communication therewith to prevent over inflation of the balloon, and a knob for inflating the inflatable balloon;

inserting the guiding instrument with the catheter supported thereby into an instrument support located on the hand restraint;
adjusting the angular orientation of the guiding instrument by adjusting the angular orientation of the instrument support; and
rotating the knob to progressively inflate the balloon to stretch the carpal tunnel.

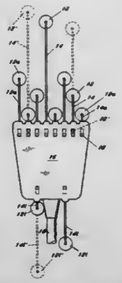
5,813,978
METHOD AND APPARATUS FOR DIRECT ACCESS ENDOSCOPIC SURGERY
Geza J. Jako, Melrose, Mass., assignor to Atlantis Surgical, Inc., Princeton, N.J.
Continuation of Ser. No. 277,094, Jul. 19, 1994, Pat. No. 5,503,617. This application Mar. 25, 1996, Ser. No. 622,555
Int. Cl.[6] A61B *17/02*
U.S. Cl. 600—201 **48 Claims**



44. An apparatus for forming an operating window to perform less invasive, direct access endoscopic surgery comprising:
a rigid frame capable of supporting an applied load required to perform retraction of an incision site;
a translation frame slidably connected to said rigid frame wherein said rigid frame and said translation frame define said operating window;
an upper blade connected to said rigid frame and a lower blade connected to said translation frame;
adjustment means operatively engaged to said translation frame and rigid frame, said adjustment means being adapted to vary the load and size of said operating window;
at least one of said upper and lower blade being pivotable about an axis substantially parallel to or coplanar with said operating window while remaining connected to said rigid frame or said translation frame, respectively; and
wherein pivoting said upper or lower blade about said axis, while connected to said rigid frame or said translation frame, respectively, increases access to a surgical site without increasing the size of the operating window.

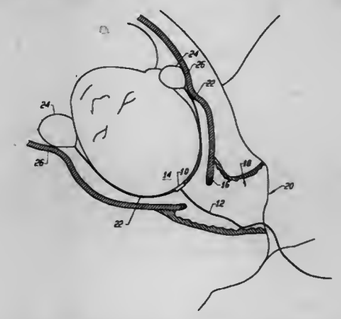
5,813,979
EKG DEVICE HAVING INDIVIDUALLY STORABLE ELETRODE LEADS
Donna A. Wolfer, 4455 S.W. 68 Ave., Davie, Fla. 33314
Filed May 9, 1997, Ser. No. 853,197
Int. Cl.[6] A61B *5/02*
U.S. Cl. 600—393 **8 Claims**

1. An EKG machine having a plurality of individually storable electrode leads each terminating in an electrode, said EKG machine comprising:
a monitor having means for generating output;
a plurality of electrodes for sensing electrical activity generated by a person's heart;
said of said plurality of electrodes individually electrically connected to said monitor by a corresponding plurality of elongated electrically conducting flexible leads; and



an enclosure, said enclosure including means for storing each of said plurality of electrode leads, each of said plurality of leads being selectively and individually movable from a retracted position wherein the lead is substantially stored within said enclosure, to an extended position wherein the lead is substantially drawn from said enclosure;
said enclosure having opposing first and second ends, each of said ends having a plurality of leads dispensed therefrom, whereby said enclosure may be disposed proximal to a patient's torso and leads may be dispensed toward the patient's upper torso from said first end, and additional leads may be dispensed toward the patient's lower torso and legs.

5,813,980
FETAL PULSE OXIMETRY SENSOR WITH REMOTE SECURING MECHANISM
Mitchell Levinson, Pleasanton; Paul Mannheimer, Danville; Steven L. Nierlich, and Phillip S. Palmer, both of San Leandro, all of Calif., assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.
Filed Aug. 13, 1996, Ser. No. 696,131
Int. Cl.[6] A61B *5/00*
U.S. Cl. 600—338 **16 Claims**



1. A perinatal pulse oximeter sensor for application to a fetus and providing a signal corresponding to blood oxygen saturation, comprising:
a sensor head having a fetus engaging surface for engagement with said fetus;
a light emitter connected to said sensor head and positioned to emit light of at least two wavelengths directed at said fetus;
a light detector mounted in said sensor head at a position to detect said light scattered through tissue of said fetus, said light detector providing said signal corresponding to blood oxygen saturation; and
securing means, coupled to said sensor head, for securing said sensor head to said fetus at a remote location of said fetus, said remote location being sufficiently removed from said

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sensor head so that said detected light doesn't scatter through tissue of said fetus deformed by said securing means in a sufficient amount to affect said measurement of blood oxygen saturation;

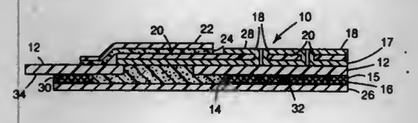
wherein said securing means biases said sensor head against a presenting part of said fetus, and said securing means is positioned to contact said fetus beyond the presenting part.

5,813,981

TAB STYLE ELECTRODE

Hatim M. Carim, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 29, 1995, Ser. No. 581,432
Int. Cl.[6] A61B *5/0408*
U.S. Cl. 600—372 **8 Claims**



1. A biomedical electrode, comprising:

(a) an insulative backing having opposing major surfaces and an aperture extending between the major surfaces;

(b) a field of ionically conductive medium contacting one major surface and extending into the aperture;

(c) an electrically conductive tab disposed on the opposing major surface at least partially covering the aperture and having an electrically nonconductive sheet of plastic coated with a first electrically conductive surface contacting the field of ionically conductive medium at the aperture and a second electrically conductive surface, wherein the tab has perforations between the first electrically conductive surface and the second electrically conductive surface to permit a coating forming surface to cover surfaces lining the perforations to provide an electrical pathway between the first and the second electrically conductive surface; and

(d) means for restraining at least a portion of the electrically conductive tab that covers the aperture.

5,813,982

NONCONTACTING PORTABLE INFRARED INTRA-OCULAR PRESSURE SENSOR

Francis I. Baratta, 138 Ridge St., Arlington, Mass. 02174-1737

Filed Feb. 22, 1994, Ser. No. 199,636
Int. Cl.[6] A61B *3/16;6/00*
U.S. Cl. 600—398 **20 Claims**

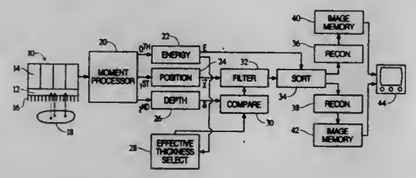
1. A method to detect relative inter-ocular pressure where: a first sensor is directed at the tympanic membrane within one ear of a patient, and where said first sensor generates a first signal proportional to a core temperature of said patient; and where a first signal processing means converts said first signal into a core output signal, and where a second detector is directed at the macula of one eye of said patient by a directing means; and where said second sensor generates a second signal proportional to the temperature of said patient's macula, and where a second signal processing means converts said second signal into a macula output signal, and where said core output signal and said macula output signal are compared by a primary comparing means, and where an output from said means is further compared with a preset value by a secondary comparison means, and where when the output exceeds preset values an alarm processing means provides audible, visible, tactile, electronic, or printed warning indicators.

5,813,983

DEPTH-OF-INTERACTION AND OTHER HIGH ORDER MOMENTS FILTERING FOR IMPROVED DETECTION IN THICK SCINTILLATION CRYSTALS

Frank P. DiFilippo, and Daniel Gagnon, both of Mayfield Heights, Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Jun. 3, 1997, Ser. No. 867,737
Int. Cl.[6] A61B *6/00*
U.S. Cl. 600—407 **19 Claims**



1. A method of diagnostic imaging comprising:

utilizing a detector having a scintillation crystal to detect radiation from a subject, said radiation interacting with the scintillation crystal and being converted into photons of light;

converting the photons of light into corresponding electronic data, which electronic data includes a coordinate of the interaction;

filtering the electronic data in accordance with a depth within the scintillation crystal at which the radiation interacted with the crystal and was converted into the photons of light;

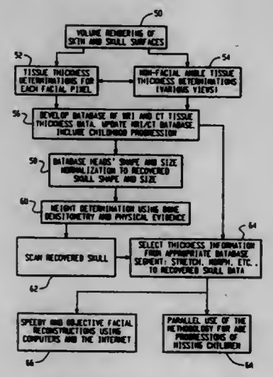
utilizing the filtered data to reconstruct an image indicative of the detected radiation.

5,813,984

FORENSIC SKULL AND SOFT TISSUE DATABASE AND ON-LINE FACIAL RECONSTRUCTION OF VICTIMS AND AGE PROGESSION PORTRAIT RENDERING OF MISSING CHILDREN THROUGH UTILIZATION OF ADVANCE DIAGNOSTIC RADIOLOGIC MODALITIES

John R. Haaga, Chagrin Falls; David A. Miller, Timberlake; Joseph P. Molter, Cleveland Heights; Jeffrey L. Duerk, Avon Lake, and Jonathan S. Lewin, Beachwood, all of Ohio, assignors to University Radiologists, Inc., Cleveland, Ohio

Filed Mar. 7, 1997, Ser. No. 812,528
Int. Cl.[6] A61B *6/00*
U.S. Cl. 600—410 **9 Claims**



1. A method for facial reconstruction comprising:

generating a database comprised of facial data representing a thickness of soft tissue located between an outer surface of a skull structure and an outer skin surface for each of a plurality of test subjects;

categorizing the facial data in accordance with selected categories of the test subjects;

averaging the facial data of the test subjects within the selected categories to obtain average facial data representing average soft tissue thickness of the selected categories;

digitizing a skull structure to allow the digitized skull structure to be graphically manipulated;

matching the skull structure to one of the categories of the facial data in the database;

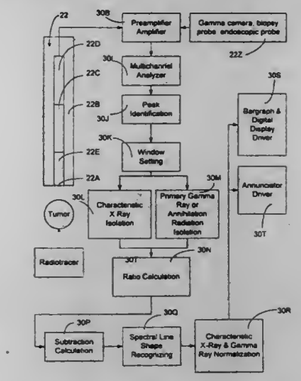
generating a facial reconstruction by providing a skin surface to the digitized skull structure in accordance with the average facial data of the corresponding category.

5,813,985

APPARATUS AND METHODS FOR PROVIDING ATTENUATION GUIDANCE AND TUMOR TARGETING FOR EXTERNAL BEAM RADIATION THERAPY ADMINISTRATION

Robert G. Carroll, Largo, Fla., assignor to Care Wise Medical Products Corporation, Morgan Hill, Calif.

Filed Jul. 31, 1995, Ser. No. 509,627
Int. Cl.[6] A61B *5/00*
U.S. Cl. 600—436 **55 Claims**



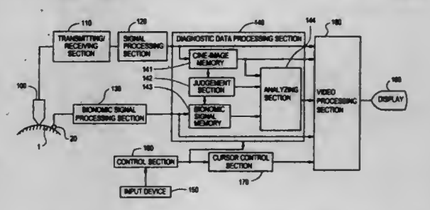
1. A system for providing precise therapy radiation to living tumor tissue within the body of a living being, said system comprising a tumor localizing radiopharmaceutical, a controllable source of therapy radiation, and radiation detecting means, said tumor localizing radiopharmaceutical being attached to the living tumor tissue, whereupon said radiopharmaceutical produces tumor-localizing radiation from the living tumor tissue, said tumor-localizing radiation comprising photons of different energies, including gamma radiation, x radiation, and/or annihilation radiation, produced by said radiopharmaceutical, said controllable source of therapy radiation being arranged for providing at least one gamma or x ray or particulate therapy beam, said radiation detecting means being arranged to be brought into various positions adjacent the body of the being for detecting said tumor localizing radiation from a plurality of directions and utilizing the known naturally occurring abundance of emitted photons of different energies of said radiopharmaceutical as a reference factor to provide an indication of the three dimensional distribution of the living tumor tissue to which said radiopharmaceutical is attached and for providing a signal indicative thereof, said controllable source of therapy radiation being arranged for receipt of said signal to precisely direct said at least one beam of said therapy radiation to the living tumor tissue to which said radiopharmaceutical is attached, whereupon said at least one beam of said therapy radiation necrotizes that tissue with minimal damage to adjacent viable tissue.

5,813,986

METHOD OF IDENTIFYING THE TIME PHASE OF THE STATE OF AN ORGAN TO BE OBSERVED, AND ULTRASONIC DIAGNOSTIC APPARATUS BASED ON THE SAME

Keiichiro Ubukata, Tokyo, Japan, assignor to GE Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Dec. 21, 1996, Ser. No. 777,751
Int. Cl.[6] A61B *8/00*
U.S. Cl. 600—440 **9 Claims**



1. In an ultrasound method of diagnosing characteristics of an organ having a contraction period and an expansion period, comprising the steps of

ultrasonically scanning sections of the organ with application and reflection of ultrasound signals;

obtaining bionomic signals of a body containing the organ;

storing the bionomic signals; and

providing ultrasonic images of the sections of the organ at a selected inspection time with the signals provided by the ultrasound scanning and utilizing the bionomic signals; the improvement comprising:

preselectively storing time periods of assumed contraction period and expansion period of the organ as measured from a spike of the bionomic signals; and

selectively inspecting said organ by directing the ultrasound scanning of the sections of the organ at a time within the time period of the assumed contraction or expansion period without having to estimate the time period of the contraction or expansion period.

5,813,987

SPECTRAL VOLUME MICROPROBE FOR ANALYSIS OF MATERIALS

Mark Modell, Brookline; Gregory DeBarysbe, Lincoln, both of Mass., and A. Ze'ev Hed, Nashua, N.H., assignors to MediSpectra, Inc., Lexington, Mass.

Continuation of Ser. No. 510,043, Aug. 1, 1995, abandoned. This application Dec. 24, 1996, Ser. No. 778,039
Int. Cl.[6] A61B *6/00*
U.S. Cl. 600—473 **25 Claims**

1. An analytic device for optical evaluation of a sample of material wherein the sample is at least partially transmissive and has an exposed face, such device comprising

first means for directing illumination at the exposed face to illuminate said sample with light wherein said first means includes a first field stop of a size larger than diffraction-limited resolution of said first means at said first field stop

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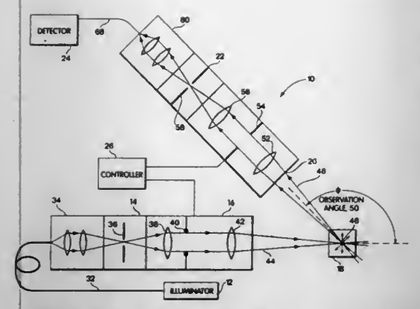


second means for collecting light wherein said second means includes a second field stop larger than diffraction—limited resolution of said second means at said second field stop, and

means for detecting illumination collected by the second means and producing a record therefrom

wherein the first and the second means are arranged in a configuration such that the first and second field stops are at least partially conjugated through a common region in said sample and such that the record corresponds to an optical response that selectively represents light emanating from a volume element containing said common region responsive to said illumination while substantially excluding light emanating from outside said volume element.

5,813,988

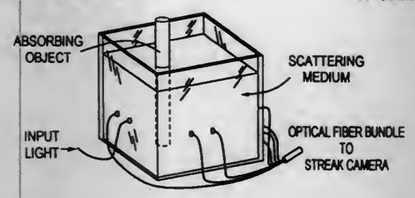
TIME-RESOLVED DIFFUSION TOMOGRAPHIC IMAGING IN HIGHLY SCATTERING TURBID MEDIA

Robert R. Alfano; Wei Cai; Feng Liu, all of Bronx, N.Y.; Melvin Lax, Summit, N.J., and Bidyut B. Das, Flushing, N.Y., assignors to Research Foundation, New York, N.Y.

Continuation-in-part of Ser. No. 384,112, Feb. 3, 1995, Pat. No. 5,625,458. This application Mar. 18, 1996, Ser. No. 618,471

Int. Cl.[6] A61B *5/00*

U.S. Cl. 600—476 **26 Claims**



1. A method of imaging an object located in a highly scattering turbid medium, said method comprising the steps of:

(a) illuminating the object through the highly scattering turbid medium with a pulse of light, whereby the light emergent from the highly scattering turbid medium consists of a ballistic component, a snake-like component and a diffusive component;

(b) determining the intensity of said diffusive component at a plurality of points in time; and

(c) using said intensity determinations to form an image of the object in the highly scattering turbid medium, said using step comprising using a mathematical inversion algorithm to generate an image of the highly scattering turbid medium, said mathematical inversion algorithm being

$$X^{(K+1)^T}=[Y^TW+X^{(K)^T}\Lambda][W^TW+\Lambda]^{-1}$$

wherein W is a matrix relating output at detector position r_d, at time t, to source at position r_s, Λ is a regularization matrix, chosen for convenience to be diagonal, but selected in a way related to the ratio of the noise, <nn> to fluctuations in the absorption (or diffusion) X_j that we are trying to determine:

$$\Lambda_{ij}=\lambda_j\delta_{ij} \text{ with } \lambda_j=\langle nn\rangle/\langle \Delta X_j \Delta X_j\rangle$$

Here Y is the data collected at the detector, and X^k is the kth iterate toward the desired absorption information.

5,813,989

DRIVING MENTAL CONDITION DETECTING APPARATUS

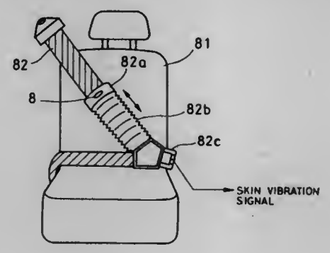
Satoshi Saitoh; Mitsuo Yasushi; Kazuhiro Akiyama, and Masatoshi Yanagidaira, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 15, 1995, Ser. No. 559,273

Claims priority, application Japan, Nov. 16, 1994, 6-282219

Int. Cl.[6] A61B *5/00;* **G08B** *23/00*

U.S. Cl. 600—484 **24 Claims**



1. A driving mental condition detecting apparatus comprising:

physiological data detector for detecting physiological data of a driver of a vehicle;

navigator for obtaining travel data of said vehicle;

driving mental condition judger for judging a mental condition of a driver by multiplying each of said physiological data and said travel data by predetermined judgment coefficients, adding the products of the multiplications and comparing the sum of the products to a predetermined judgement threshold value; and

alarm generator for generating an alarm when the sum of the products is greater than the predetermined judgement threshold value, thereby indicating that said driver has a deteriorated driving mental condition.

5,813,990

PROJECTED DISPLAY SPORT GOGGLE

David Lloyd Ryll, 7670 S. Olive Cir., Englewood, Colo. 80112

Filed May 15, 1995, Ser. No. 440,899

Int. Cl.[6] A61B *5/02*

U.S. Cl. 600—500 **20 Claims**

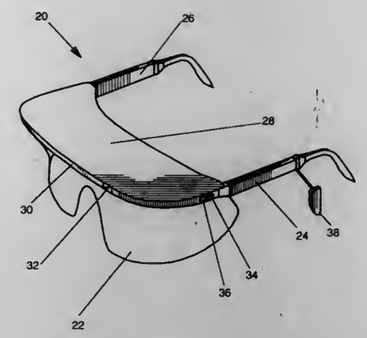
1. A head mounted athletic activity monitoring device, said device comprising:

a housing having a predetermined cross-sectional shape and an internal chamber with a mounting surface;

an attaching means functioning to attach said housing to a user's head;

a transparent material having a predetermined cross-sectional shape and an underside, said transparent material being partially reflective in nature;

a securing means functioning to secure said transparent material to said housing;



an electro-optical projection means functioning to project an image on said underside of said transparent material, said electro-optical projection means mounted on said mounting surface;

a battery powered microprocessor circuit means electrically connected to said electro-optical projection means, said microprocessor circuit means mounted on said mounting surface; and

a movement sensing means electrically connected to said microprocessor circuit means, said movement sensing means functioning to provide an electronic output representative of movement which corresponds to the user's speed, said movement sensing means mounted on said mounting surface, thereby enabling the user to visually perceive his speed.

5,813,991

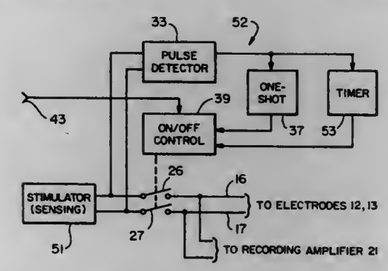
ENDOCARDIAL MAPPING SYSTEM AND METHOD

N. Parker Willis, Atherton; Marsha Hurd, Clayton, and Donald Chin, Palo Alto, all of Calif., assignors to Cardiac Pathways Corporation, Sunnyvale, Calif.

Filed Apr. 25, 1997, Ser. No. 842,942

Int. Cl.[6] A61B *55/04*

U.S. Cl. 600—510 **15 Claims**



1. In an endocardial mapping system: a catheter having an electrode which can be positioned at a site within a heart, means connected continuously to the electrode for monitoring electrograms from the site, a stimulator for providing a pacing pulse, and means for connecting the stimulator to the electrode while the pacing pulse is being provided and disconnecting the stimulator from the electrode at times other when the pulse is being provided.

5,813,992

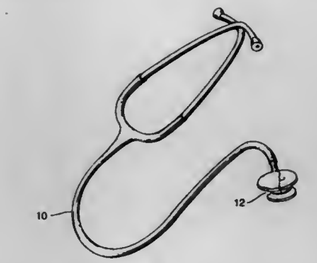
SINGLE USE INDICATOR FOR STETHOSCOPES

Peter S. W. Henwood, 72 New Bond Street, London, England, W1Y 9DD

Filed May 20, 1997, Ser. No. 859,653

Int. Cl.[6] A61B *00/00*

U.S. Cl. 600—528 **12 Claims**



1. A single use indicator for a stethoscope with a chestpiece having a generally circular anterior surface which is placed against the skin of a patient during use, a generally circular outer rim, and a posterior surface, comprising:

a) a disposable cover formed of a thin, elastomeric, liquid-impervious material removably secured to the chestpiece such that said cover completely covers the anterior surface and outer rim of the chestpiece, thereby physically isolating the anterior surface from contaminants;

b) means for effecting a visual change in the appearance of said cover when the stethoscope is used; and

c) said cover being elastic and generally circular or slightly parabolic with an interior portion and a peripheral edge portion, said peripheral edge portion having an unstretched diameter less than that of the outer rim of the chestpiece and stretched over the anterior surface and outer rim of the chestpiece in order to engage the posterior surface of the chestpiece so that said interior portion of said cover overlays the anterior surface of said chestpiece, and resilience which maintains said engagement with the posterior surface while said interior portion overlays the anterior surface of said chestpiece.

5,813,993

ALERTNESS AND DROWSINESS DETECTION AND TRACKING SYSTEM

Richard Frederic Kaplan, Richmond Heights, and Kenneth Alan Loparo, Chesterland, both of Ohio, assignors to Consolidated Research of Richmond, Inc., Richmond Heights, Ohio

Filed Apr. 5, 1996, Ser. No. 628,474

Int. Cl.[6] A61B *5/04*

U.S. Cl. 600—544 **67 Claims**

1. A system adapted to measure in a human subject a state along a continuum relating to alertness, drowsiness, sleep, unconsciousness, or anesthesia comprising:

means for acquiring a brain-wave signal having rhythmic components from the subject;

means for selecting components of said brain-wave signal lying in a predetermined range of frequencies including frequencies above 30 Hz;

means responsive to said selecting means for determining a contribution to said brain-wave signal due to said components lying in said range; and

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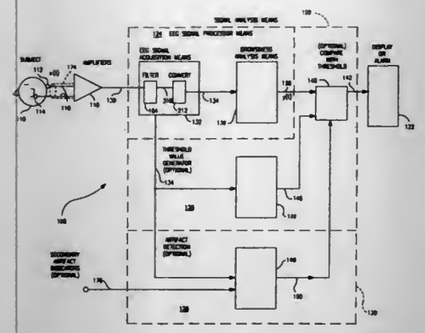


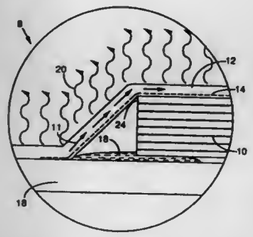
means responsive to said contribution-determining means for producing an output-measure signal indicative of said state of the subject.

5,813,994

METHOD AND APPARATUS FOR MEASURING HEAT FLOW

Paul A. Pottgen, 4561 Dogwood Dr., Allison Park, Pa. 15101, and Neil J. Szuminsky, 1427 Hilsdale Ave., Pittsburgh, Pa. 15216

Division of Ser. No. 70,185, Jun. 2, 1993, Pat. No. 5,524,618. This application Nov. 14, 1994, Ser. No. 338,674
Int. Cl.[6] A61B *10/00*
U.S. Cl. 600—549 **37 Claims**



1. A method of determining caloric expenditure by measuring substantially total heat flow from a measured surface through the use of a heat flow sensor comprising:

(a) placing said heat flow sensor on said measured surface and allowing a fluid to migrate from said measured surface to a sensing region of said heat flow sensor, wherein the step of allowing said fluid to migrate is accomplished with a material capable of transporting said fluid from said measured surface to said sensing region and allowing evaporation of said transported fluid from said sensing region; and

(b) measuring heat flow at said sensing region of said heat flow sensor.

5,813,995

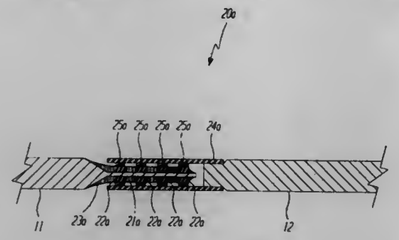
Patent Not Issued For This Number

5,813,996

GUIDE WIRE EXTENSION SYSTEM WITH MAGNETIC COUPLING

Jon P. St. Germain, Elk River; David J. Blaeser, Champlin, and Roger N. Hastings, Maple Grove, all of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Dec. 21, 1995, Ser. No. 576,601
Int. Cl.[6] A61B *5/00*
U.S. Cl. 600—585 **17 Claims**



1. A guide wire extension system, comprising:

a. a guide wire having a proximal end;

b. an extension wire having a distal end disposed adjacent the proximal end of the guide wire; and

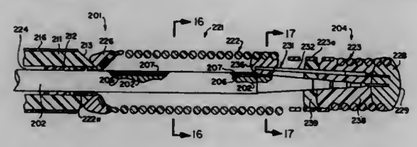
c. means for magnetically coupling the proximal end of the guide wire to the distal end of the extension wire in an end-to-end relationship, the magnetic coupling means including a receiving portion and an insertion portion wherein the insertion portion is adapted to be inserted into the receiving portion, the magnetic coupling means further including a magnet portion and a magnetically responsive portion, wherein the magnetic portion includes a plurality of magnets.

5,813,997

GUIDE WIRE WITH DEFLECTABLE TIP AND METHOD

Mir A. Imran, Palo Alto; Deepak R. Gandhi, San Jose; Henry Bourang, Turlock; Dignah B. Quiachon, Palo Alto, and Andrew Y. Chow, Sunnyvale, all of Calif., assignors to Intelliwire, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 331,216, Oct. 28, 1994, Pat. No. 5,542,434. This application Aug. 1, 1996, Ser. No. 690,749
Int. Cl.[6] A61B *5/00*
U.S. Cl. 600—585 **11 Claims**



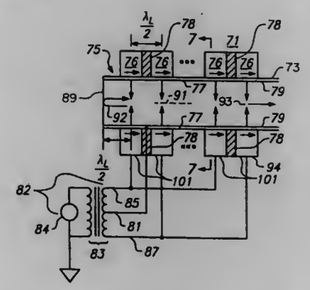
1. A guide wire for use in a medical procedure and for use with a power supply comprising a core wire having proximal and distal extremities, the proximal extremity having a predetermined diameter and at least a portion of the distal extremity having a reduced size with respect to said predetermined diameter and a coil assembly mounted on the distal extremity of the core wire, a tip, an actuator member having proximal and distal extremities, means securing the proximal extremity of the actuator member to the core wire, means securing the distal extremity of the actuator member to the tip, said actuator member extending along the core wire, said actuator member having a portion thereof formed of a shape memory material and having a shape memory therein, heating means disposed in the vicinity of said portion of the actuator member for heating said portion to cause it to assume the predetermined shape memory and electrical conductive means connected to said heating means and extending to the proximal extremity of the core wire and being adapted to be connected to said power supply to supply energy to the heating means.

5,813,998

METHOD AND SYSTEM FOR COUPLING ACOUSTIC ENERGY USING AN END-FIRE ARRAY

J. Fleming Dias, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1996, Ser. No. 608,107
Int. Cl.[6] A61B *17/22*
U.S. Cl. 601—2 **18 Claims**



1. An acoustic system that conveys acoustic waves between a source and a destination, said system comprising:

a substantially solid acoustic waveguide extending substantially between the source and destination, the acoustic wave guide having a waveguide axis along which acoustic waves are longitudinally transmitted, and a waveguide outer surface;

an end fire array of acoustic transducers positioned along and adjacent to the waveguide axis, the end fire array transducing longitudinal waves traveling along the waveguide axis, individual transducers in the end fire array being spaced apart from each other along the waveguide axis at fractions of a predetermined wavelength. the predetermined wavelength corresponding to a selected excitation frequency of the acoustic transducers and associated wave velocity of the longitudinal waves in the acoustic waveguide and

a mechanism for electronically equalizing phases between the transducers, given with their spacings apart, such that the end fire array is tuned to the selected excitation frequency, with the transducers adapted to produce outputs that mutually reinforce one another.

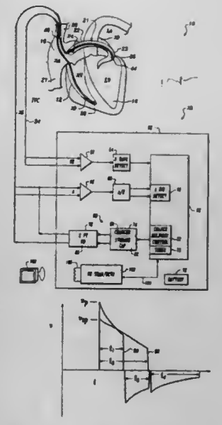
5,813,999

IMPLANTABLE ATRIAL DEFIBRILLATOR PROVIDING REDUCED CARDIOVERSION DISCOMFORT

Gregory M. Ayers, Duvall, and Darrell O. Wagner, Gold Bar, both of Wash., assignors to InControl, Inc., Redmond, Wash.

Filed Dec. 21, 1995, Ser. No. 576,671
Int. Cl.[6] A61N *1/00*
U.S. Cl. 604—890.1 **7 Claims**

1. An implantable atrial cardioverter for applying cardioverting electrical energy to atria of a heart, said cardioverter including at least one lead having an electrode adapted to be in electrical contact with an atrium of the heart, a storage capacitor for storing electrical energy and a discharge control for controlling discharge of the storage capacitor to apply the cardioverting energy to the electrode adapted to be in electrical contact with the atrium of the heart, said storage capacitor having a capacitance greater than or equal to 120 μF and said discharge control causing said storage capacitor to be discharged for a discharge time greater than eight milliseconds.

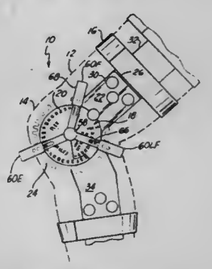


5,814,000

ADJUSTABLE JOINT BRACE

Bryan Kilbey, DeFuniak Springs, Fla., assignor to Professional Products, Inc., DeFuniak Springs, Fla.

Filed Jul. 12, 1996, Ser. No. 679,188
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—16 **14 Claims**



1. An adjustable joint brace comprising:

(a) a first gear member having a plurality of gear teeth along at least a portion of its outer periphery;

(b) sliding latch means rotatable with respect to said first gear member for engaging said gear teeth, said sliding latch means comprising locking means for locking said sliding latch means with respect to selected said gear teeth;

(c) an elongated support pivotally secured to said first gear member and configured to engage said locking means of said sliding latch means, said locking means restricting the rotation of said elongated support with respect to said first gear member, said locking means of each said sliding latch means comprise at least one movable pin sized to fit intermediate adjacent said gear teeth, said elongated support also being configured to engage said pin, thereby restricting the further rotation of said elongated support, said movable pin of each said locking means being biased to engage said gear teeth, said bias being overcome when said movable pin is moved to engage other said gear teeth;

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(d) securing means for securing said first gear member and said elongated support adjacent a user's joint, said securing means comprising closure means secured adjacent the joint to be braced;

(e) indica means attached to said first gear member for indexing the positioning of said sliding latch means with respect to said first gear member;

(f) a plurality of said sliding latch means rotatable with respect to said first gear member;

(g) a second gear member pivotally supported on an opposite side of said elongated support from said first gear member, said second gear member also having a plurality of gear teeth along at least a portion of its outer periphery;

(h) a center fastening means pivotally securing said first and second gear members, said sliding latch means, and said elongated support together, said elongated support comprising a recess therein on one side of said center fastening means and a notch on an opposite side of said center fastening means, said recess and said notch each being equally radially spaced from said center fastening means and each being sized to engage a said movable pin therein, whereby when both said recess and said notch engage their respective movable pin, said elongated support is no longer pivotable with respect to said gear members; and,

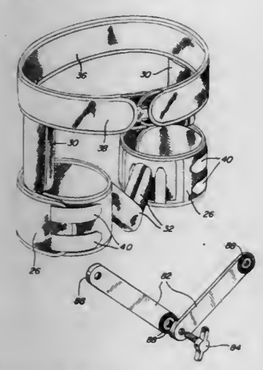
(i) a cushion means secured to said brace intermediate the user's joint and said brace.

5,814,001

ORTHOPEDIC HIP AND LEG ABDUCTOR

Shannon R. Schwenn, Orland, and Bryan J. Puch, Apopka, both of Fla., assignors to Orthomerica Products, Inc., Newport Beach, Calif.

Filed Jul. 25, 1997, Ser. No. 900,202
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—24 **4 Claims**



1. An orthopedic leg abductor comprising:

a belt to be secured about a user's torso;

first and second adjustable thigh sleeves, and first and second plates mounted so as to be opposed to each other on said first and second adjustable thigh sleeves;

a pair of locking linkages each comprising first and second rigid members connected in a pivoting relationship, each linkage connecting said belt to one of said adjustable sleeves, said linkage determining an angular relationship between said belt and said connected adjustable sleeve, said linkages further including a rigid paddle for insertion into said connected adjustable sleeve; and

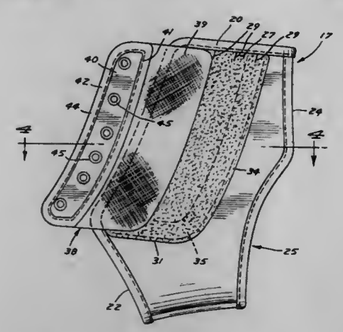
a collapsible hinge assembly separating said first and second plates of said adjustable thigh sleeves, said collapsible hinge assembly determining an expandable distance between said first and second adjustable thigh sleeves.

5,814,002

ADJUSTABLE SIZE ANKLE BRACE

Ronald E. Nelson, 1120 Second St., Box 441, Chetek, Wis. 54728

Filed May 1, 1997, Ser. No. 848,898
Int. Cl.[6] A61F *5/00;5/37*
U.S. Cl. 602—27 **17 Claims**



1. An adjustable size ankle brace, comprising:

a base of flexible material shaped to wrap around the rear and sides of a foot and ankle;

a first removable flap for releasable connection to a first side of the base, and a second removable flap for releasable connection to a second side of the base;

first attachment means for attachment of the first removable flap to the first side of the base, and second attachment means for attachment of the second removable flap to the second side of the base;

said first flap carrying a first eyelet strip having a set of lace eyelets, and second flap carrying a second eyelet strip having a set of lace eyelets;

a lace trained between the eyelets on the first and second eyelet strips;

whereby the positioning of the side flaps on the base is adjustable by removing the flaps from the base and repositioning them on the base according to the size of the foot of the intended wearer of the brace.

5,814,003

PULSATILE ANTI-EMBOLISM STOCKING

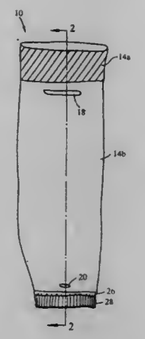
Samuel M. Knox, and Michael R. Griffin, both of Hickory, N.C., assignors to Alba-Waldensian, Inc., Valdese, N.C.

Filed Sep. 4, 1996, Ser. No. 697,982
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—63 **17 Claims**

1. A stocking for securing a pulsatile bladder to a person's body comprising:

a circularly knit tubular outer sleeve having upper and lower circumferential ends, and

a circularly knit tubular inner sleeve including upper and lower circumferential ends, said inner sleeve being positioned within said outer sleeve and having its upper end secured to said outer sleeve proximate the upper end thereof and its lower end secured to said outer sleeve proximate the lower



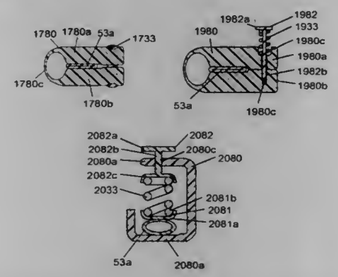
end thereof to define a cylindrically shaped pocket therebetween, and said outer sleeve including an opening for enabling a pulsatile bladder to be operatively positioned within said pocket.

5,814,004

SYSTEM FOR REGULATING PRESSURE WITHIN AN EXTRACORPOREAL CIRCUIT

Yehuda Tamari, 21 Singworth St., Oyster Bay, N.Y. 11771-3703

Continuation-in-part of Ser. No. 852,931, Mar. 13, 1992, Pat. No. 5,186,431, which is a continuation of Ser. No. 683,093, Apr. 10, 1992, abandoned, which is a continuation of Ser. No. 410,845, Sep. 2, 1989, abandoned, said Ser. No. 999,217 Ser. No. 16,034, Feb. 10, 1993, Continuation-in-part of Ser. No. 852,931, Continuation-in-part of Ser. No. 669,641, Mar. 14, 1991, Pat. No. 5,215,540, and Ser. No. 876,627, May 6, 1992. This application Jun. 7, 1995, Ser. No. 475,208
Int. Cl.[6] F16K *7/06;* **A61M** *37/00;39/28*
U.S. Cl. 604—4 **7 Claims**



1. A system for regulating pressure in an extracorporeal circuit, said system comprising:

(a) an extracorporeal circuit for circulation of blood, said circuit having at least a plurality of blood compatible tubing members with connectors therebetween for circulation of blood therethrough, said circuit having a plurality of devices for circulating and treating blood, each device having at least a blood inlet side and a blood outlet side;

(b) at least one shunt tubing bridging one of said devices and connecting said outlet side to said inlet side, said shunt having a thin wall portion;

(c) a pressure responsive valve normally closing said shunt tubing below a predetermined pressure said valve having first and second clamping members which engage opposite sides of said thin wall portion of said shunt tubing and a resilient means for urging said clamping members together to clamp said shunt tubing below a predetermined pressure;

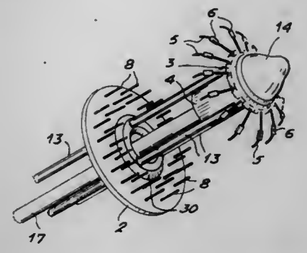
whereby said pressure responsive valve normally closes said shunt tubing, but opens said shunt when the blood pressure in the shunt is greater than the pressure defined by the predetermined pressure of said pressure responsive valve.

5,814,005

VENTRICULAR CANNULATION DEVICE

Jean-Aubert Barra, Brest Cedex, and Rene Paillot, Orly, both of France, assignors to ELA Medical S.A., Montrouge, France

Filed Dec. 22, 1992, Ser. No. 995,047
Claims priority, application France, Dec. 23, 1991, 91 15981
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—8 **48 Claims**



1. A ventricular cannulation device for providing communication through an opening in the cardiac wall comprising:

an outer part, for placement on the cardiac wall, having a first central opening and a first means for catching onto said cardiac wall;

an inner part having a size suitable for placement in the cardiac chamber, having a second central opening and second means in the form of a plurality of claws for catching onto the cardiac wall and means for guiding and attaching said outer part; and

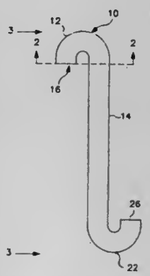
a tube corresponding to the openings of said cardiac wall and inner and outer parts and serving as a support for a vascular prosthesis.

5,814,006

TEMPORARY STENT IN THE URINE PATH

Konrad Planz, Sachsenstrassn 4, D-36013 Pfulda, Germany

Filed May 28, 1996, Ser. No. 653,776
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—8 **17 Claims**



1. A stent comprising a solid member having passage means therein, for placement in the urinary tract, said member being made

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entirely of a material which is stable in the urine path at between pH 5 to 6, but becomes soluble upon change of the pH of said path to between pH 7 to 9.

5,814,007

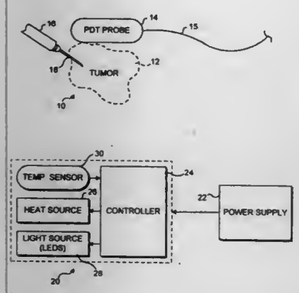
Patent Not Issued For This Number

5,814,008

METHOD AND DEVICE FOR APPLYING HYPERTHERMIA TO ENHANCE DRUG PERFUSION AND EFFICACY OF SUBSEQUENT LIGHT THERAPY

James C. Chen, Bellevue, Wash., and Brent Wiscombe, Mesa, Ariz., assignors to Light Sciences Limited Partnership, Issaquah, Wash.

Filed Jul. 29, 1996, Ser. No. 688,058
Int. Cl.[6] A61N *1/30*
U.S. Cl. 604—21 **27 Claims**



1. A method for increasing a perfusion of a drug through tissue at a treatment site where photodynamic therapy is to be administered, comprising the steps of:

a) positioning a probe having thereon a light emitting means for administering photodynamic therapy so that the probe is disposed adjacent to the treatment site, said probe further including means thereon for providing heat separate from said light emitting means;

b) energizing the means for providing heat to supply heat to the tissue at the treatment site without energizing the light emitting means, said heat raising the temperature of the tissue; and

c) delivering the drug to the tissue at the treatment site, an elevated temperature of the tissue caused by the heat increasing the perfusion of the drug through the tissue at the treatment site to enhance an effect of the drug on the tissue.

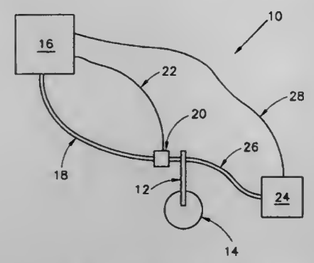
5,814,009

FLUID MANAGEMENT SYSTEM AND REPLACEABLE TUBING ASSEMBLY THEREFOR

Steven Wheatman, Lower Gwynedd, Pa., assignor to Cabot Technology Corporation, Wilmington, Del.

Filed Oct. 11, 1996, Ser. No. 731,375
Int. Cl.[6] A61M *3/04*
U.S. Cl. 604—21 **21 Claims**

1. A replaceable tubing assembly for use with a fluid delivery system having a pump for delivering fluid at an operator-selected pressure from a supply, a surgical instrument through which fluid is delivered to a surgical site, and a controller connected to said pump, said controller being responsive to said operator-selected pressure, said replaceable tubing assembly comprising:



a fluid delivery tube defining a passage for the flow of fluid, said fluid delivery tube comprising an upstream portion for releasable connection to the supply of fluid and a downstream portion with a downstream end positioned for releasable connection to the surgical instrument, whereby fluid is deliverable from the supply of fluid, through said passage, and into the surgical instrument under the influence of the pump; and

a pressure transducer connected to said fluid delivery tube at said downstream portion, said pressure transducer positioned to sense the pressure of fluid in said passage in said downstream portion of said fluid delivery tube for generating an electrical signal corresponding to sensed fluid pressure, and means connected to said pressure transducer and adapted for releasable connection to the controller for transmitting said electrical signal from said pressure transducer to the controller;

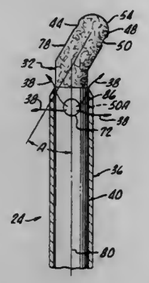
wherein, during use, said upstream portion of said fluid delivery tube is releasably connected to the supply of fluid, said downstream end of said fluid delivery tube is releasably connected to the surgical instrument, and said means for transmitting said electrical signal is releasably connected to the controller, and wherein fluid pressure in said downstream portion of said fluid delivery tube is continuously controlled by said controller to increase, decrease or maintain a substantially constant fluid pressure in response to said electrical signal from said pressure transducer and the operator-selected pressure.

5,814,010

SAFETY-VAC CAPSULE POLISHER

Robert "Zig" Ziegler, Salt Lake City, Utah, assignor to Allergan, Inc., Irvine, Calif.

Filed Aug. 8, 1995, Ser. No. 512,713
Int. Cl.[6] A61B *17/20*
U.S. Cl. 604—22 **13 Claims**



1. An irrigation and aspiration handpiece tip comprising:

aspiration tube means for removal of tissue from an eye, said aspiration tube means including first vacuum port means, in vacuum communication with said aspiration tube means, for applying vacuum within the eye in order to remove tissue therefrom and pass same into said aspiration tube means, said aspiration tube means further including second vacuum port means for controlling vacuum pressure within said aspiration tube means and said first vacuum port means, said first and second vacuum port means being disposed in said aspiration tube means in a spaced-apart angular relationship from one another, said second vacuum port means being of different size than said first vacuum port means in order to control vacuum pressure within said aspiration tube means;

irrigation tube means for providing irrigation fluid to flush tissue toward said first vacuum port means; and

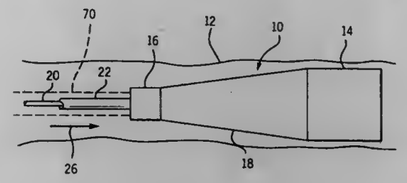
means, disposed on said aspiration tube means for polishing an eye capsule.

5,814,011

ACTIVE INTRAVASCULAR LUNG

Russell A. Corace, Grand Rapids Township, Mich., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 25, 1996, Ser. No. 638,019
Int. Cl.[6] A61M *37/00*
U.S. Cl. 604—23 **21 Claims**



1. An active intravascular lung assist device configured for insertion into a cavity of a patient through which blood flows, said device comprising:

a gas exchanger adapted to deliver oxygen to blood flowing across the gas exchanger when positioned within the cavity;

a pump positioned adjacent the gas exchanger and adapted to receive blood therethrough, the pump creating a differential blood pressure across the gas exchanger thereby forcing blood through the exchanger and;

a catheter fluidly interconnecting the gas exchanger and the pump;

whereby the gas exchanger when positioned in the cavity can deliver oxygen to the blood independent of blood fluid flow generated by the patient's heart.

5,814,012

METHOD AND APPARATUS FOR RELIEVING EXCESS INSUFFLATION PRESSURE

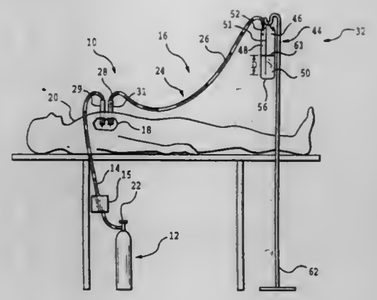
Richard P. Fleenor, Englewood, and Alan R. Lee, Littleton, both of Colo., assignors to Birtcher Medical Systems, Inc., Utica, N.Y.

Continuation of Ser. No. 251,736, Mar. 16, 1992, abandoned. This application Mar. 12, 1993, Ser. No. 30,632
Int. Cl.[6] A61M *37/00;1/00;5/00;* **A61B** *5/08*
U.S. Cl. 604—26 **27 Claims**

1. An apparatus for use in an insufflation system to relieve insufflation pressure in a body cavity in excess of a predetermined value, said insufflation system including a source of insufflation gas, an inlet conduit for one-way insufflation gas flow from said source to said body cavity, and an exhaust port for one-way insufflation gas flow away from said body cavity, said apparatus comprising:

a receptacle containing a fluid; and

conduit means for allowing one-way flow of insufflation gas from said body cavity into said fluid contained in said receptacle when an insufflation pressure in said body cavity



exceeds a predetermined value, said conduit means having a first end for receiving insufflation fluid from said body cavity via said exhaust port and a second end positioned a predetermined distance beneath a top surface of said fluid contained in said receptacle wherein, during use, insufflation gas is exhausted from said body cavity via said conduit means when said insufflation pressure exceeds said predetermined value.

18. A method for relieving excess insufflation pressure in a body cavity, comprising the steps of:

providing an insufflation gas exhaust assembly including a receptacle for containing a fluid and an exhaust line having a first open end and a second end for submersion within said fluid;

attaching said first open end to an exhaust port for exhausting insufflation gas from said body cavity; and

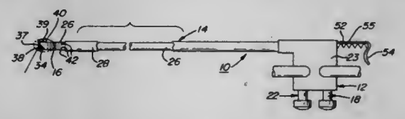
establishing one-way insufflation fluid communication from said body cavity to said receptacle via said exhaust line.

5,814,013

IRRIGATING AND ASPIRATING SURGICAL DEVICES

John M. Levin, 412 Fairview Rd., Narbeth, Pa. 19072

Filed Jan. 25, 1996, Ser. No. 591,078
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—35 **4 Claims**



1. An irrigating and aspirating surgical device including an elongate cannula adapted to be placed adjacent a body part to be irrigated or aspirated, said cannula including a conduit having aside wall section and an endwall, said conduit including an internal passage for receiving irrigating fluid or aspirating suction, valve means for communicating a source of irrigating fluid and aspirating suction with said conduit, and pores extending through the end wall, and the side wall section of said conduit adjacent a distal end of said conduit for communicating said irrigating fluid or aspirating suction with the body part to be irrigated or aspirated, wherein the improvement comprises a closure overlying the end wall, which is located at the distal end of said internal passage of the conduit, said closure being fluid impervious for closing said internal passage at the distal end thereof.

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5,814,014

TECHNIQUES OF TREATING NEURODEGENERATIVE DISORDERS BY BRAIN INFUSION

Dennis D. Elsberry, New Hope, and Mark T. Rise, Monticello, both of Minn., assignors to Medtronic Incorporated, Minneapolis, Minn.

Division of Ser. No. 640,358, Apr. 30, 1996, Pat. No. 5,735,814. This application Jul. 29, 1997, Ser. No. 902,548

Int. Cl.[6] A61M *3/00*

U.S. Cl. 604—43 **7 Claims**

1. A system for treating a neurodegenerative disorder resulting in degenerating neurons forming part of a central nervous system comprising in combination:

an implantable pump;

a catheter having a proximal end coupled to said pump and a discharge portion for infusing into a predetermined infusion site in said central nervous system a therapeutic dosage of at least one drugs capable of altering the level of excitation of neurons in said brain related to a degenerating neurons;

a sensor for generating a signal related to an attribute of said nervous system which indicates the hyperexcitation of said degenerating neurons or of neurons related to said degenerating neurons; and

control means responsive to said sensor signal for regulating said therapeutic dosage.

5,814,015

INFUSION PUMP FOR AT LEAST ONE SYRINGE

Diane A. Gargano, Cambridge; Eric J. Flachbart, Hamilton; Barry Cowen, Waltham; Monica Duh, Lincoln; John L. Rudser, Jr., Westwood; Ken Zhen, Cambridge; Lynn Noble, Lexington; Julian Warhurst, Ashland, and Luis Pedraza, West Roxbury, all of Mass., assignors to Harvard Clinical Technology, Inc., South Natick, Mass.

Filed Feb. 24, 1995, Ser. No. 394,441

Int. Cl.[6] A61M *31/00*

U.S. Cl. 664—67 **61 Claims**

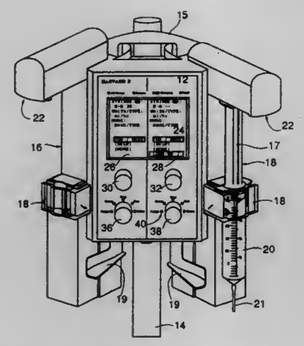
1. A syringe pump system comprising:

a central control module in a housing having:

a display screen;

a syringe holding station for each of a plurality of drug syringes and holding each syringe in a plunger pushing position to said housing;

a plunger pusher assembly for each said syringe holding station and operating under control of a controller for pushing a plunger of each syringe;



a syringe display driver for said syringe holding stations providing plural syringe status and command menu displays in side-by-side relationship at different portions of said display screen;

a command identification and select control for each syringe associated with a display portion allowing user creation of a drug administration regimen for each syringe associated with that display portion;

a plunger pusher state selector associated with each display portion for controlling a plunger pusher state associated with each display portion; and

a processor responsive to data from system components for applying operating data signals to said syringe display driver and said plunger pusher assembly.

5,814,016

ENDOVASCULAR SYSTEM FOR ARRESTING THE HEART

Kirsten L. Valley, Mountain View; David W. Snow, Woodside; Timothy C. Corvi, Belmont; Brian S. Donion, Los Altos Hills; Stephen W. Boyd, Redwood City; Sylvia W. Fan, San Francisco; Alex T. Roth, Redwood City; William S. Peters, Woodside; Richard J. Mueller, Jr., Byron, and Hanson S. Gifford, III, Woodside, all of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Division of Ser. No. 486,216, Jun. 7, 1995, which is a continuation of Ser. No. 282,192, Jul. 28, 1994, Pat. No. 5,584,803, which is a continuation of Ser. No. 162,742, Dec. 3, 1993, abandoned, which is a continuation of Ser. No. 123,411, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 991,188, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 730,559, Jul. 16, 1991, Pat. No. 5,370,685, and a continuation-in-part of Ser. No. 159,815, Nov. 30, 1993, Pat. No. 5,433,700, and a continuation-in-part of Ser. No. 281,962, Jul. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 163,241, Dec. 6, 1993, Pat. No. 5,571,215, which is a continuation-in-part of Ser. No. 23,778, Feb. 22, 1993, Pat. No. 5,452,733, and a continuation-in-part of Ser. No. 281,981, Feb. 28, 1994, which is a continuation-in-part of Ser. No. 23,778, Feb. 22, 1993, Pat. No. 5,452,733, and a continuation-in-part of Ser. No. 213,760, Mar. 16, 1994, Pat. No. 5,458,574. This application Feb. 7, 1997, Ser. No. 797,229

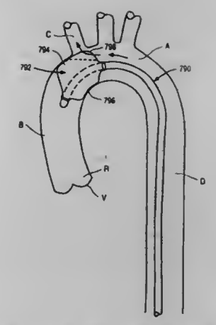
Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—96 **4 Claims**

1. An aortic occlusion catheter, comprising:

a shaft having a first lumen; and

means for occluding a patient's ascending aorta between the coronary ostia movable from an expanded shape to a collapsed shape, the occluding means also being shaped such that it can be seated across the opening to the brachiocephalic artery while permitting blood flow into the brachiocephalic artery;



the first lumen having an outlet positioned distal to the occluding means and having a size sufficient to deliver cardioplegic fluid to the patient's heart at a rate sufficient to arrest the patient's heart.

5,814,017

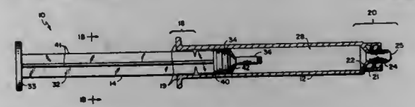
SINGLE USE SYRINGE DEVICE

James S. Kashmer, Andover, N.J., assignor to SafeGard Medical Products, Inc., Woburn, Mass.

Filed Jul. 18, 1996, Ser. No. 687,112

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **22 Claims**



1. An apparatus comprising:

a barrel having a first end, a second end, an internal surface and a longitudinal axis, said barrel first end having a cap portion having an inner surface, an outer surface and a port connecting said inner surface to said outer surface;

a piston having a cross section adapted to substantially conform to said barrel internal surface;

a plunger in communication with a piston, said plunger adapted to move said piston along said barrel longitudinal axis between said barrel first end and said barrel second end;

a locking pin longitudinally connected to said plunger, said locking pin having at least one detent, said piston adapted to surround at least a portion of said locking pin; and

a locking mechanism in communication with said plunger to lock said piston at said barrel first end, said locking mechanism disposed at said port and further having a locking ring in communication with said port, said locking ring biased toward said longitudinal axis, said locking ring adapted to engage said at least one locking pin detent,

whereby said piston is locked when said plunger is moved to said barrel first end.

5,814,018

NEEDLE POINT GUARD SAFETY CAP ASSEMBLY

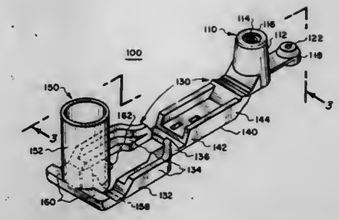
Edward E. Elson, Anaheim, Calif., and Lawrence R. Koh, 11755 Wilshire Blvd., 9th Fl., Los Angeles, Calif., assignors to Lawrence R. Koh, Los Angeles, Calif.

Filed Jun. 20, 1997, Ser. No. 879,879

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **33 Claims**

1. A needle point cover assembly for securely covering and protecting the needle point of a syringe after the syringe has been used, comprising:



a needle point cover in the form of an elongated hollow member that is open at one end for receiving the needle therein, and at its other end is mostly enclosed by an end wall having a hole through which the needle can pass;

a lid enclosing upon the otherwise open end of the cover member, the lid also having a hole through which the needle may pass so that the needle may extend through both holes;

an extensible frame that is manually actuable for moving the cover member along the needle when the syringe is being readied for disposal; and

means coupling one end of the extensible frame to the cover member and responsive to the actuation of the extensible frame for moving the cover member to where its end wall is beyond the extremity of the needle point;

the cover member then being supported by the hole in the lid and rotating about the lid hole until the needle point passes inside the enclosed end wall of the cover member into a protected position where it cannot pass through the cover member hole.

5,814,019

IMPLANTABLE INFUSION PUMP

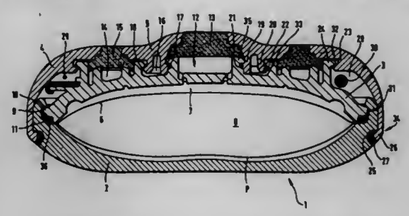
Bernd Steinbach, and Claus Walter, both of Bad Homburg, Germany, assignors to Fresenius AG, Germany

Filed Mar. 15, 1996, Ser. No. 618,431

Claims priority, application Germany, Mar. 17, 1995, 195 09 634.7

Int. Cl.[6] A61N *31/00*

U.S. Cl. 604—131 **16 Claims**



1. An implantable infusion pump for the dosed administration of medications into the human body, comprising:

a pumping chamber, which is formed by a lower chamber part; and an upper chamber part connected thereto, wherein

a) the pumping chamber is divided by a gas impermeable flexible divider into two subchambers;

b) the first subchamber is delimited by the upper chamber part and the flexible partition and is designed as a reservoir for medicinal solutions, the upper part of the chamber has a refill opening which is sealed by at least one pierceable septum, and the reservoir for medicinal solutions is connected to an outlet catheter via an outlet opening, and

c) the second subchamber is delimited by the lower chamber part and the flexible partition and is designed as a pressure chamber to accommodate a propellant, wherein the gas impermeable flexible divider is a convex metal foil follow-

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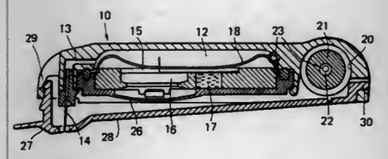
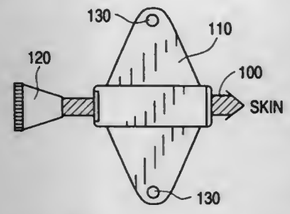
ing the contour of the inner form of the upper part of the chamber and is covered with a first polymer film on the side facing the medicinal solution.

5,814,020
MEDICAMENT DELIVERY DEVICE
Joseph Gross, Dublin, Ireland, assignor to Elan Medical Technlogies Limited, Athlone, Ireland
Filed Sep. 6, 1996, Ser. No. 708,230
Claims priority, application Ireland, Sep. 11, 1995, 950702
Int. Cl.[6] A61M *37/00*
U.S. Cl. 604—41 **63 Claims**



1. A medicament delivery device comprising a housing, a reservoir within the housing, a filling mechanism for the reservoir integral with the housing and gas generated means for driving the medicament from the filled reservoir, the filling mechanism being adapted to receive a container for the medicament, said container being sealed by a penetrable stopper, and the filling mechanism comprising means for penetrating the stopper, said penetrating means being in communication with the reservoir to allow the medicament to be transferred from the container to the reservoir via the filling mechanism.

5,814,021
ADJUSTABLE SECURING WINGS
Daniel J. Balblerz, Redwood City, Calif., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.
Filed Dec. 26, 1996, Ser. No. 773,975
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—174 **34 Claims**

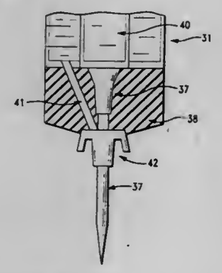


1. An adjustable anchoring device to retain a catheter cannula, the anchoring device comprising:

a securing member with a body portion having an opening extending through said body portion, said opening with a first dimension to retain the catheter cannula at a desired location inside a patient by frictionally engaging said catheter cannula, and a second dimension that is larger than said first dimension such that said securing member can slidably move about the catheter cannula,

a dilator member having a body with a forward end and an opening extending through said body portion larger than the outside dimension of the catheter cannula, wherein said forward end is adapted to detachably mate with said securing member through a portion of said opening of said securing member and to dilate said body portion of said securing member from having an opening with said first dimension to having an opening with said second dimension.

5,814,022
METHOD AND APPARATUS FOR APPLYING TISSUE SEALANT
Richard D. Antanavich, Paso Robles, and Randel Dorian, Orinda, both of Calif., assignors to Plasmaseal LLC, San Francisco, Calif.
Filed Feb. 6, 1996, Ser. No. 595,936
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—191 **10 Claims**



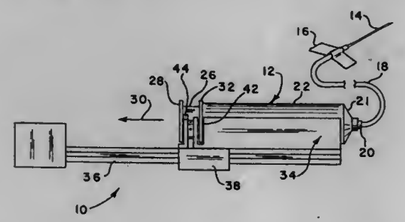
1. A dispenser comprising:

a plurality of separate parallel cylindrical compartments arranged concentrically, each of said cylindrical compartments having an outlet port at one end,

a number of plungers equal to said plurality of cylindrical compartments, and

a manifold having separate means for transporting fluid through the manifold from the outlet port of each cylindrical compartment to a common location on the surface of the manifold opposite said outlet ports.

5,814,023
ASPIRATOR SYRINGE OPERATOR
Paul F. Fulk, West Carrollton, and Earnie S. Philpot, Centerville, both of Ohio, assignors to Para Tech Industries, Inc., Moraine, Ohio
Filed Sep. 19, 1997, Ser. No. 933,635
Int. Cl.[6] A61M *05/00*
U.S. Cl. 604—232 **15 Claims**



1. A device for operating an aspirating syringe having an elongated tubular cylinder with an open end and a needle end remote from the open end, a piston closing said open end and movable between said needle end and said open end for extracting body fluid through a hollow needle associated with the needle end and for dispensing the fluid through the needle when moved from said open end toward the needle end, said piston having a shaft extending outwardly therefrom beyond the open end of said cylinder and including a laterally outwardly-directed first flange at the shaft distal end, and a laterally outwardly-directed second flange integral with the cylinder and essentially surrounding its open end, said device comprising:

an elongated body member having a generally U-shaped recess extending the length thereof for nesting said cylinder therein during aspirating operation of said syringe, the cross-sectional shape of said recess comprising a semi-cylindrical portion and a wall portion at each side of said semi-cylindrical portion, said wall portions being spaced apart slightly in excess of said cylinder diameter;

an inwardly-directed flexible bead extending along each wall portion remote from said semi-cylindrical recess, said beads being spaced apart across said recess less than said cylinder diameter whereby said cylinder can be pressed laterally into said recess by spreading said beads and retained in said recess by said beads when in said recess;

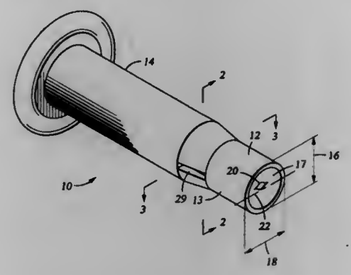
a transverse slot adjacent an open end of the body member for laterally receiving said second flange when said cylinder is placed in said recess whereby to retain said cylinder against axial movement;

an elongated guide track affixed to said body member and extending away from the cylinder open end to a limit position of movement of said shaft;

a thumb pressure pad at an end of said track; and

a carriage movable along said track, said carriage having outwardly-directed, diametrically-opposed wing portions enabling one hand operation of said carriage from a first position adjacent said cylinder open end in a thumb-and-two-finger closing operation toward a second position adjacent said thumb pressure pad, and said wing portions, when said syringe is pressed into said recess with said piston at the needle end of said cylinder, positioning said first flange intermediate said wing portions and said pressure pad to ready the syringe for operating said shaft and piston in an aspirating direction.

5,814,024
NEEDLELESS VALVE
John Thompson, San Clemente, Calif., and David Ziv, Haqalil, Israel, assignors to Elcam Plastics, Merom, Israel
Filed Nov. 27, 1996, Ser. No. 757,156
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—246 **23 Claims**



1. A valve assembly for connecting intravascular fluid flow components, said valve assembly comprising:

a substantially tubular housing;

a compressible elastomeric septum slidably disposed within said tubular housing for axial movement between a proximal position and a distal position of said septum;

a spring element for biasing said septum from said distal position to said proximal position;

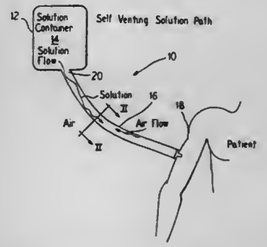
a slit formed axially through said septum;

a first radial loading contour within said tubular housing for applying substantially radial compressive force to a first transverse dimension of said septum when said septum is in said proximal position, to hold said slit in a closed state; and

a second radial loading contour within said tubular housing for applying substantially radial force to a second transverse dimension of said septum when said septum is in said distal position, to hold said slit in an open state;

wherein said septum is slidable from said proximal position to said distal position by axial force exerted by a fluid fitting being connected to a proximal portion of said tubular housing.

5,814,025
SELF-VENTING FLUID SYSTEM
Dale Severs, Gurnee, Ill., assignor to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 390,149, Feb. 16, 1995, Pat. No. 5,562,638, which is a continuation of Ser. No. 80,852, Jun. 21, 1993, abandoned. This application Jun. 10, 1996, Ser. No. 662,427
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—266 **11 Claims**



1. A delivery system for allowing a selected liquid in an environment having constant temperature and constant pressure acting thereon to be fed from a container to a second environment in a closed system, the delivery system comprising:

a selected liquid having a density and an inherent surface tension at a constant temperature and at a constant pressure wherein the liquid is selected based upon calculations of gravitational force and surface tension;

a container having an interior holding the selected liquid; and

a tubing suspended from the container and in fluid communication with the interior of the container wherein the tubing has a length and an angle of orientation with respect to a vertical axis wherein the length at the angle of orientation is defined between the container and the second environment and is so constructed and arranged to allow the selected liquid to flow from the interior of the container and through the tubing to counteract the inherent surface tension of the selected liquid in the tubing such that the inherent surface tension is less than a gravitational force on the selected liquid along the length of the tubing, thereby preventing air entrapment in the tubing wherein the tubing has an inner circumferential wall manufactured having a circumference selected such that the gravitational force on the selected liquid at all points along the length of the tubing is greater than the inherent surface tension of the selected liquid.

5,814,026
ENDOSCOPIC PORTAL HAVING A UNIVERSAL SEAL AND METHODS FOR INTRODUCING INSTRUMENTS THERETHROUGH
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131
Filed Mar. 19, 1996, Ser. No. 618,328
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—280 **28 Claims**

1. An endoscopic portal for establishing communication with a body cavity for the introduction of instruments through the endoscopic portal comprising

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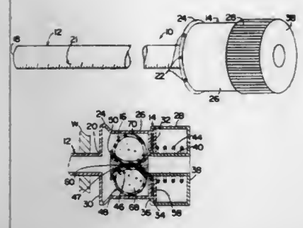


a resilient seal member having a variable size passage for communication with the body cavity to permit instruments of various cross sectional sizes to extend through said variable size passage for introduction of distal ends of the instruments in the body cavity, said seal member being disposed in a closed position wherein said variable size passage is closed and being movable to an open position wherein said variable size passage is open;

a tubular expander aligned with said variable size passage and being insertable in said seal member to move said seal member from said closed position to said open position such that instruments of various cross sectional sizes can be introduced through said tubular expander and said seal member to extend through said variable size passage, said tubular expander being withdrawable from said seal member such that instruments of various cross sectional sizes introduced through said tubular expander and said seal member remain in said variable size passage to extend therethrough

a mass of compressible material disposed externally around said seal member with said variable size passage extending longitudinally within said mass of compressible material and

a housing confining said mass of compressible material therein such that said mass of compressible material is compressed within said housing when said tubular expander is inserted in said seal member and when instruments of various cross sectional sizes extend through said variable size passage after said tubular expander is withdrawn from said seal member, said mass of compressible material exerting a compressive force on said seal member such that said seal member sealingly engages instruments of various cross sectional sizes in said variable size passage to form a seal therewith.

5,814,027

GUIDING INTRODUCER USED FOR MEDICAL PROCEDURES WITHIN THE RIGHT VENTRICLE ASSOCIATED WITH THE RIGHT VENTRICULAR OUTFLOW TRACK

James A. Hassett, Bloomington, and John D. Ockuly, Minnetonka, both of Minn., assignors to Daig Corporation, Minnetonka, Minn.

Continuation of Ser. No. 421,763, Apr. 14, 1995, abandoned, which is a continuation-in-part of Ser. No. 146,744, Nov. 3, 1993, Pat. No. 5,427,119. This application Aug. 13, 1996, Ser. No. 696,337

Int. Cl.[6] A61B *5/00*

U.S. Cl. 604—286 **18 Claims**

11. A guiding introducer for use with an ablation catheter for the ablation and mapping of areas of the right ventricle of the heart associated with the right ventricular outflow tract comprising separate and distinct first, second and third sections wherein said

guiding introducer is shaped to guide the ablation catheter to the area of the heart associated with the right ventricular outflow tract.

5,814,028

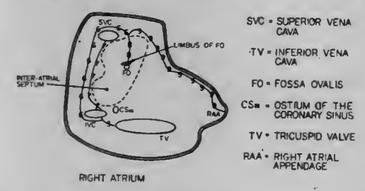
CURVED GUIDING INTRODUCERS FOR CARDIAC ACCESS

John F. Swartz, Tulsa, Okla., and John Ockuly, Minneapolis, Minn., assignors to Daig Corporation, Minnetonka, Minn.

Division of Ser. No. 272,014, Jul. 18, 1994, Pat. No. 5,575,766, which is a continuation-in-part of Ser. No. 147,168, Nov. 3, 1993, Pat. No. 5,497,774, and Ser. No. 146,744, Nov. 3, 1993, Pat. No. 5,427,119. This application Oct. 23, 1996, Ser. No. 735,527

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—280 **18 Claims**



1. A guiding introducer comprising a first, second and third sections, wherein the introducer is shaped in accordance with anatomical structures of chambers of the human heart, wherein the first section is a generally elongated hollow straight section ending in a distal end, wherein the second section is merged with the distal end of the first section and comprises a curved section ending in a distal end, and wherein the third section is merged with the distal end of the second curved section and comprises a generally straight section and a curved section ending in a distal end of the guiding catheter.

5,814,029

GUIDING INTRODUCER SYSTEM FOR USE IN ABLATION AND MAPPING PROCEDURES IN THE LEFT VENTRICLE

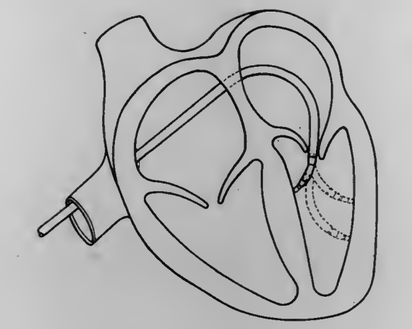
James A. Hassett, Bloomington, Minn., assignor to Daig Corporation, Minnetonka, Minn.

Continuation-in-part of Ser. No. 388,800, Feb. 14, 1995, Pat. No. 5,640,944, Ser. No. 389,252, Feb. 16, 1995, Pat. No. 5,722,400, Ser. No. 333,791, Nov. 3, 1994, Pat. No. 5,564,440, and Ser. No. 333,759, Nov. 3, 1994, Pat. No. 5,628,316. This application Jun. 10, 1996, Ser. No. 661,094

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—281 **9 Claims**

1. A guiding introducer system for treatment of arrhythmia associated with the left ventricle from the ventricular side compris-



ing a precurved inner guiding introducer and a precurved outer guiding introducer, wherein the outer guiding introducer is formed in a predetermined shape designed to extend through an interatrial septum to a mitral valve of a human heart, wherein said guiding introducers are used in combination.

5,814,030

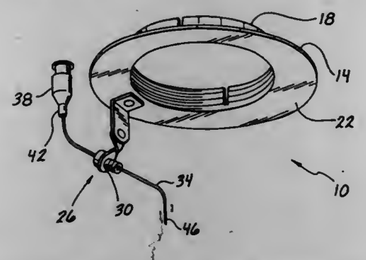
PRE-STERILIZED, DISPOSABLE, OPHTHALMIC IRRIGATION DEVICE

Thomas R. Hedges, Jr., 245 Nicholson Dr., Moorestown, N.J. 08057, and David Jaspan, 105 Spring House Ct., Cherry Hill, N.J. 08002

Continuation-in-part of Ser. No. 373,580, Jan. 17, 1995, abandoned. This application Nov. 27, 1996, Ser. No. 757,373

Int. Cl.[6] A61M *35/00*

U.S. Cl. 604—294 **10 Claims**



1. An ophthalmic irrigation device for use in conjunction with a surgical microscope comprising:

a. a spike means for connection to a standard saline solution bag;

b. a cannula means for delivering saline solution to the surgical site;

c. a ball socket positioning means, through which said cannula means passes, for controlling positioning of said cannula means;

d. a bracket means, attached to said ball socket positioning means, for attaching said ball socket positioning means to said surgical microscope;

e. a tubular connection means for connecting said spike means to said cannula means; and

f. a pressure means, positioned around said tubular connection means, for controlling the rate of flow of saline solution through said tubular connection means.

5,814,031

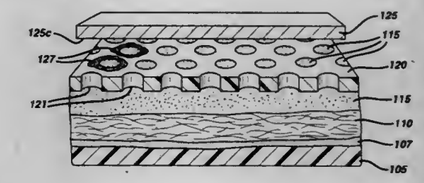
STRUCTURED OCCLLUSIVE DRESSINGS

Mark Mooney, 293 Waterloo Ct., Somerset, N.J. 08873; Anthony Gallo, 91 King George Rd., Warren, N.J. 07059, and John Perucki, 26 Bailey Dr., Washington Crossing, Pa. 18977

Continuation-in-part of Ser. No. 397,596, Mar. 2, 1995, abandoned. This application Nov. 21, 1995, Ser. No. 560,248

Int. Cl.[6] A61F *13/02*

U.S. Cl. 604—307 **43 Claims**



1. An occlusive wound care dressing comprising a backing material, a support material, an occlusive composition and a porous covering material, said backing material having applied thereto an adhesive which secures said support material to said backing material; said occlusive composition overlying the upper surface of said support material; said porous covering material overlying at least the upper surface of said occlusive composition; and said occlusive composition comprising a silicone wax, wherein said silicone wax further comprises stearoxytrimethylsilane.

5,814,032

PERCUTANEOUS ADMINISTRATION TAPE PREPARATION

Mitsuhiko Hori; Katsuhiro Yamamoto, and Tetsuo Watanabe, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 375,984, Jan. 20, 1995, abandoned. This application May 12, 1997, Ser. No. 855,897

Claims priority, application Japan, Jan. 21, 1994, 6-004908

Int. Cl.[6] A61F *13/02;* **B32B** *9/04*

U.S. Cl. 604—307 **3 Claims**

1. A percutaneous administration tape preparation composed of a sheet-form support, a drug-containing pressure-sensitive adhesive layer, and a separator, wherein the drug-containing pressure-sensitive adhesive layer comprises a uniform dispersed state containing from 50 to 95% by weight one or more kinds of elastomers, from 5 to 50% by weight a hygroscopic material, and a percutaneous absorption drug so that a part of the hygroscopic material contained therein remains on the applied surface at detaching the tape preparation from the applied surface, and wherein said hygroscopic material absorbs from 3 to 30 wt. % water based on a water-free weight of said pressure-sensitive adhesive layer.

5,814,033

OSTOMY COUPLING

John Victor Edwards, Reigate, Great Britain, assignor to Salt & Son Limited, Birmingham, United Kingdom

PCT No. PCT/GB95/01352, § 371 Date Dec. 12, 1996, § 102(e) Date Dec. 12, 1996, PCT Pub. No. WO95/34258, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 9, 1995, Ser. No. 750,648

Claims priority, application United Kingdom, Jun. 13, 1994, 9411790

Int. Cl.[6] A61F *5/44*

U.S. Cl. 604—342 **8 Claims**

1. An ostomy coupling comprising two rings which can be interengaged concentrically, the inner ring (1*a*) having a flange (2)

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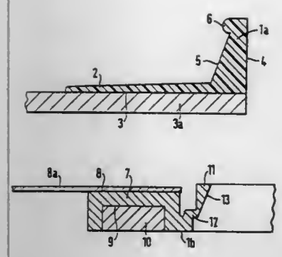


at one end for attachment to an abdominal pad and a radially outwardly directed peripheral bead (**6**) at its other end, and the outer ring (**1***b*) having a radially outwardly directed flange (**7**) for attachment to an ostomy pouch and a lip (**11**) which engages behind the peripheral bead (**6**) on the inner ring in order to secure the two rings of the coupling together, characterised in that the flange on the outer coupling ring (**1***b*) includes a stiffening member (**10**) made of a material stiffer than that forming the outer coupling ring and disposed in a recess (**9**) formed in said flange of said outer ring (**1***b*), said recess being open at the opposite surface to the surface attached to the pouch, whereby said stiffening member acts to restrain the outer coupling ring from expanding away from the inner coupling ring when the two parts of the coupling are interengaged in use.

5,814,034

METHOD FOR THE MANUFACTURING OF AN ABSORBENT STRUCTURE AND AN ABSORBENT ARTICLE

Urban Widlund, Mölnlycke; Eje Österdahl, Västra; Roy Hansson, Mölndal, and Milan Kolar, Sundsvall, all of Sweden, assignors to Mölnlycke AB, Göteborg, Sweden

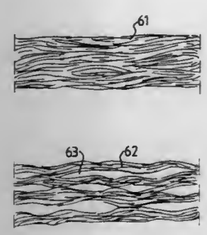
PCT No. PCT/SE93/00973, § 371 Date Aug. 2, 1995, § 102(e) Date Aug. 2, 1995, PCT Pub. No. WO94/10955, PCT Pub. Date May 26, 1994

PCT Filed Nov. 15, 1993, Ser. No. 436,271

Claims priority, application Sweden, Nov. 17, 1992, 9203445

Int. Cl.[6] A61F *13/15;* **D01G** *25/00*

U.S. Cl. 604—367 **21 Claims**



1. The use, in absorbent structures incorporated in absorbent articles, such as diapers, sanitary napkins, tampons, panty protectors, incontinence guards, bed protectors, wound or sore dressings, saliva absorbents and like articles, of a web dry-formed of particulate material containing 30–100% flash-dried cellulose fibres to a web with a weight per unit area of 100–2000 g/m^2, compressed to a density of 0.3–1.0 g/cm^3, and mechanically softened and delaminated before incorporation as the absorbent structure without any subsequent defibration and fluffing.

5,814,035

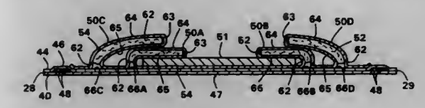
ARSORBENT ARTICLE INCLUDING LIQUID CONTAINMENT BEAMS AND LEAKAGE BARRIERS

Stanley Michael Gryskiewicz, Woodstock; Frank Jerrel Akin, Marietta; David Martin Jackson, Roswell, all of Ga., and Earle Harry Sherrod, Appleton, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of Ser. No. 476,742, Jun. 7, 1995, Pat. No. 5,575,785. This application Oct. 21, 1996, Ser. No. 731,812

Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—385.1 **20 Claims**



1. An absorbent article, comprising:

a garment shell comprising a moisture barrier and defining a longitudinal axis, a transverse axis, longitudinal side edges, an interior surface, and an acquisition zone, the acquisition zone consisting of a central one-third of the garment shell in both longitudinal and transverse directions;

first and second liquid containment beams, each liquid containment beam comprising an absorbent material and having:

longitudinal ends which define therebetween a length dimension;

opposite attachment and free edges which extend between the longitudinal ends, the attachment and free edges defining therebetween a width dimension; and

opposite top and bottom surfaces which define therebetween a thickness dimension, a ratio of the width dimension to the thickness dimension being at least about 3:1; and

leakage barriers comprising a liquid impermeable material, the leakage barriers bonded to the top surfaces of the containment beams;

wherein each attachment edge is bonded to the interior surface between the acquisition zone and one of the longitudinal side edges, each bottom surface is adapted to lie against the interior surface, and each liquid containment beam is adapted to pivot about an axis defined by its attachment edge and be moveable relative to the moisture barrier; and

wherein the acquisition zone has a saturated liquid retention capacity that is from 0 to about 30 percent of a total saturated liquid retention capacity of the absorbent article.

5,814,036

ABSORBENT ARTICLE AND A METHOD FOR ITS MANUFACTURE

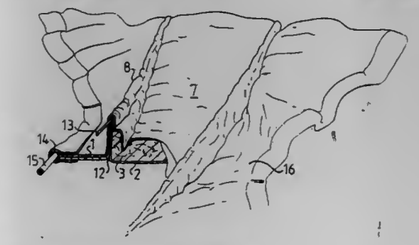
Peter Rönnberg, Mölndal, and Olle Carlbark, Kållered, both of Sweden, assignors to Mölnlycke AB, Gothenberg, Sweden

Continuation of Ser. No. 433,465, May 11, 1995, abandoned. This application Jun. 3, 1997, Ser. No. 867,922

Claims priority, application Sweden, Nov. 11, 1992, 9203372

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—385.1 **20 Claims**



1. An absorbent article comprising:

a generally rectangular blank including a liquid permeable inner casing sheet, a liquid impermeable outer casing sheet, said sheets each having a first surface and a second surface, said first surface of the inner casing sheet facing said first surface of the outer casing sheet, and an absorbent body enclosed between the first surfaces of the two casing sheets, the blank having two mutually opposing transverse side edges, two mutually opposing longitudinal side edges extending between the transverse side edges, and a longitudinal center axis extending intermediate the longitudinal side edges;

at least two fold lines, each of which fold lines are located between the longitudinal center axis and a respective one of the associated opposing longitudinal side edges;

an inner join line and an outer join line which prior to folding extend on opposite sides of each of the fold lines on the outer casing sheet, wherein the inner and outer join lines on the outer casing sheet associated with each fold line are brought together and joined to form at least two folds raised above the second surface of said inner casing sheet;

a dimension of the article taken in a direction transverse to the fold lines varying along a length of the article due to the relative locations of the fold lines and the join lines, whereby at least two folds are formed on the inside of the article and form leakage-prevention barriers whose height is essentially inversely proportional to the dimension of the article in the direction transverse to the associated fold line obtained by the formation of the fold;

wherein the inner join line associated with one of the fold lines extends at least partially over the absorbent body, such that the absorbent body extends into the leakage-prevention barrier formed by the fold;

said article in a folded state including a front part, a back part and a narrower part which is narrower than at least one of said front and back parts, and the join lines having an arcuate shape such that the height of the leakage prevention barriers decreases at least in one direction toward either the front part or back part from a maximum height in the narrower part of said article;

a distance between the outer join line located nearest the longitudinal side edge of the article and the associated fold line at each point along said fold line is smaller than the distance between this join line and the longitudinal side edge, such that flexible side flaps are formed between each of the leakage-prevention barriers and the longitudinal side edges; and

at least one elastic element provided at each longitudinal side edge of the blank, said elastic element forming a curved leg elastic tending to contract around a wearer's legs when the article is worn.

5,814,037

TAILORED AND PROTECTIVE UNDERGARMENTS

Fredrica V. Coates, Earlysville, Va., assignor to Tailored Technologies, Inc., Earlysville, Va.

Continuation of Ser. No. 639,145, Apr. 29, 1996, Pat. No. 5,707,364, which is a continuation of Ser. No. 207,485, Mar. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 104,700, Aug. 11, 1993, Pat. No. 5,409,476. This application Aug. 28, 1996, Ser. No. 704,065

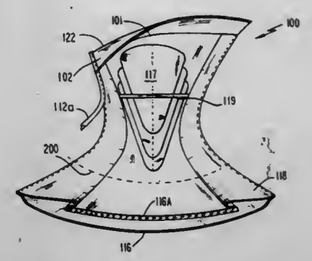
Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—393 **5 Claims**

1. A urine retaining garment comprising:

an elongated inner piece of fluid absorbent material establishing an inner surface channel for receiving a fluid absorbent pad, opposite sides of the inner piece of fluid absorbent material being profiled to conform to a user's legs; and

drop strips of fluid resistant material extending from opposite sides of said inner piece, each strip having one side fastened to the inner piece of fluid absorbent material and an opposite side being elastic, the elastic bowing the drop strips and inner piece of fluid absorbent material longitudinally to form a cradle for cupping the pubis of the user when the urinal is



worn, and wherein corresponding ends of said drop strips are joined together by an outer piece of fluid resistant material;

a frontal end of said outer piece of fluid resistant material being inwardly folded to overly a portion of the inner surface of the inner piece of fluid absorbent material to establish a cuff for receiving one end of the pad.

5,814,038

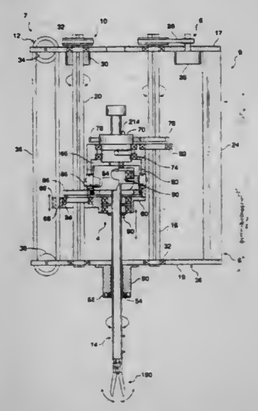
SURGICAL MANIPULATOR FOR A TELEROBOTIC SYSTEM

Joel F. Jensen, Redwood City, and John W. Hill, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation of Ser. No. 487,020, Jun. 7, 1995, abandoned. This application Mar. 27, 1997, Ser. No. 824,977

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—1 **22 Claims**



1. An apparatus for manipulating a surgical instrument in a sterile surgical field comprising:

a hand controller located remote from the surgical field;

a support base fixable to a surface;

a sterilizable instrument holder movably mounted on said support base and adapted to releasably hold the surgical instrument, the instrument holder comprising:

a body; and

an instrument support movably mounted on said body and having an interface engageable with the surgical instrument to releasably mount the instrument to said instrument holder;

a drive assembly operatively coupled to said instrument holder for providing said instrument with at least two degrees of freedom, said drive assembly comprising;

a first controllable motor operatively connected to move said instrument support; and

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a second controllable motor operatively connected to move said instrument holder body relative to said support base;

a servomechanism coupling the hand controller to the drive assembly such that movements of the surgical instrument directly correspond to the same movements of the hand controller; and

a coupling mechanism for removably attaching said instrument holder to said support base and said drive assembly, wherein said instrument holder is separable from said support base and said drive assembly for sterilization of said instrument holder between surgical procedures.

5,814,039

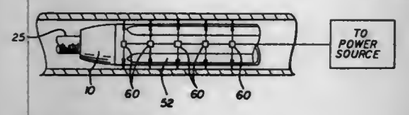
LASER CATHETER

Marvin A. Prescott, 833 Moraga Dr., Ste. 15, Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 632,630, Apr. 15, 1996. This application Aug. 26, 1996, Ser. No. 703,488

Int. Cl.[6] A61B *17/36;* **A61N** *5/06*

U.S. Cl. 606—7 **22 Claims**



15. A catheter comprising:

a main bousing having a main lumen defined therethrough;

a first extended housing extending from the main housing and having a first extended lumen in communication with the main lumen;

a second extended housing extending from the main housing and having a second extended lumen in communication with the main lumen;

a first plurality of subsidiary lumens disposed through the first extended housing;

a second plurality of subsidiary lumens disposed through the second extended housing;

an electrically insulated strip disposed longitudinally along an outer edge of the first extended housing;

a first plurality of vertical cavity surface-emitting lasers disposed in the first insulated strip;

a second electrically insulated strip disposed longitudinally along an outer edge of the second extended housing;

a second plurality of vertical cavity surface-emitting lasers disposed in the second insulated strip; and

means for delivering power to the vertical cavity lasers.

5,814,040

APPARATUS AND METHOD FOR DYNAMIC COOLING OF BIOLOGICAL TISSUES FOR THERMAL MEDIATED SURGERY

J. Stuart Nelson; Thomas E. Milner, both of Irvine, Calif., and Lars O. Svaasand, Trondheim, Norway, assignors to The Regents of the University of California, Oakland, Calif.

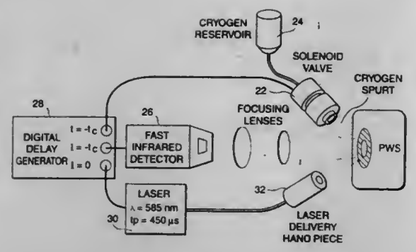
Continuation of Ser. No. 222,976, Apr. 5, 1994, abandoned. This application May 15, 1995, Ser. No. 441,930

Int. Cl.[6] A61N *5/06*

U.S. Cl. 606—9 **20 Claims**

1. A method for performing laser treatment of biological tissues comprising the steps of:

cooling a selected portion of said biological tissue for a predetermined first time period to establish a predetermined non-equilibrium dynamic temperature gradient through said tissue so that substantially only said selected portion of said biological tissue is cooled by a predetermined minimum temperature drop, said predetermined dynamic temperature gradient being established by providing a spurt of a predetermined amount of



cryogenic liquid in direct contact with said biological tissue for said first time period at a site which is later irradiated for a predetermined second time period; and

immediately after said first time period irradiating a superficial and deeper part of said selected portion of said biological tissue for said second time period to thermally treat said deeper part of said biological tissue while leaving said superficial part of said biological tissue substantially undamaged, said cryogenic liquid having a latent heat of vaporization, said superficial part of said biological tissue being cooled for said second time period by a change of state of said cryogenic liquid to vapor, heat being quickly dissipated from said superficial part of said biological tissue by means of supplying said latent heat of vaporization to said cryogenic liquid, said heat being dissipated in an amount as determined by said predetermined amount of cryogenic liquid applied to said superficial part of said biological tissue, the amount of dissipation of said heat from said superficial part of said biological tissue being specified by said predetermined amount of said cryogenic liquid applied to said superficial part of said biological tissue and by said latent heat of vaporization of said cryogenic liquid,

whereby said deeper part of said selected portion of said biological tissue may be laser treated without damage to said superficial part.

5,814,041

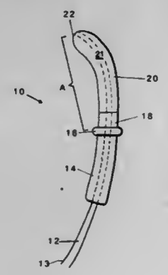
LASER ILLUMINATOR

R. Rox Anderson, Lexington, Mass.; Nayantara Bhatta, Skowhegan, Me., and Scott Prahl, Brookline, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 384,345, Feb. 1, 1995, Pat. No. 5,527,308, which is a continuation of Ser. No. 35,530, Mar. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 854,942, Mar. 20, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,698

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—15 **14 Claims**



1. An illuminator comprising

a differential optical radiator comprising a first region having a first level of reflectivity and a first level of transmissivity and a second region having a second, higher level of reflectivity and a second, lower level of transmissivity, and

a laser fiber disposed within said differential optical radiator, said laser fiber including a diffusively reflective coating,

said first and said second regions being positioned and their reflectivities and transmissivities chosen such that said differential optical radiator produces a substantially uniform pattern of illumination from said first and second regions.

5,814,042

APPARATUS FOR APPLYING LASER BEAM TO LIVING TISSUE TO CAUSE UNIFORM ABLATION OF LIVING TISSUE WHILE NOT CAUSING THERMAL DAMAGE BELOW A PREDETERMINED DEPTH TO THE SURROUNDING TISSUE

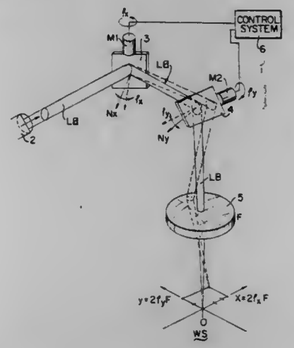
Eliezer Zair, Bnei Brak, Israel, assignor to Laser Industries, Ltd., Tel Aviv, Israel

Continuation of Ser. No. 738,304, Oct. 25, 1996, abandoned, which is a division of Ser. No. 358,386, Dec. 19, 1994, Pat. No. 5,582,752. This application Nov. 24, 1997, Ser. No. 976,918

Claims priority, application Israel, Dec. 17, 1993, 108059

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—17 **13 Claims**



1. An apparatus for causing ablation of an irradiated material of living tissue while not causing thermal damage below a predetermined depth, the irradiated material consisting of a plurality of elements; said apparatus including:

a laser to provide a laser beam with at least a predetermined power density to said living tissue for a predetermined lasing duration, said laser beam producing thermal effects upon interaction with at least a portion of said living tissue; and

a scanner for displacing said laser beam to trace a plurality of circular scans over said living tissue while continuously varying the diameters of said circular scans such that a spiral pattern is formed on said living tissue at a rate to produce substantially homogeneous ablation of at least a portion of said living tissue while not causing thermal damage below a predetermined depth.

5,814,043

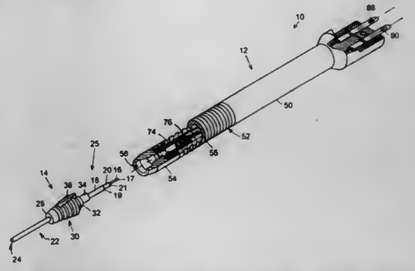
BIPOLAR ELECTROSURGICAL DEVICE

Mark Shapeton, Chestnut Hill, Mass., assignor to Mentor Opthalmics, Inc., Norwell, Mass.

Filed Sep. 6, 1996, Ser. No. 709,181

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—48 **25 Claims**



1. A replaceable tip for a surgical device of the kind that includes a handle having an opening and a plurality of coaxial, axially spaced electrical contacts therein, said tip comprising

a housing having a proximal end and a distal end, the proximal end of the housing configured to be received within the opening of the handle, and

a plurality of electrodes disposed through said housing, said electrodes having distal ends that extend distally from the distal end of said housing and proximal ends that are coaxial and axially spaced from each other and that extend proximally from the proximal end of said housing for connection to the coaxial, axially spaced electrical contacts of the handle when the proximal end of said housing is inserted in the opening of the handle,

the proximal end of said housing being constructed to be releasably secured to the handle for operation of said surgical device solely by inserting the proximal end of the housing axially into the opening of the handle.

5,814,044

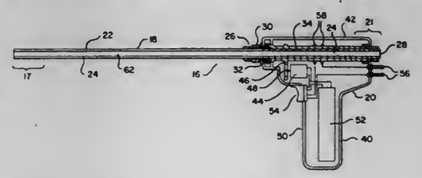
APPARATUS AND METHOD FOR MORSELATING AND REMOVING TISSUE FROM A PATIENT

Michael D. Hooven, Cincinnati, Ohio, assignor to Enable Medical Corporation, Cincinnati, Ohio

Filed Feb. 10, 1995, Ser. No. 386,970

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—48 **20 Claims**



1. Apparatus for morselating tissue within a body cavity of a patient comprising:

an elongated shaft comprising an outer tube, an inner tube disposed within said outer tube, a proximal end portion, and a distal end portion, said inner and outer tubes being open at their distal ends;

said inner and outer tubes being rotatable with respect to each other; and

electrode surface carried by a rotatable one of said tubes in proximity to the distal end of said tube and being rotatable therewith.

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5,814,045

Patent Not Issued For This Number

5,814,046

PEDICULAR SCREW AND POSTERIOR SPINAL INSTRUMENTATION

Christoph Hopf, Mainz, Germany, assignor to Sofamor S.N.C., Rang Du Fliers, France

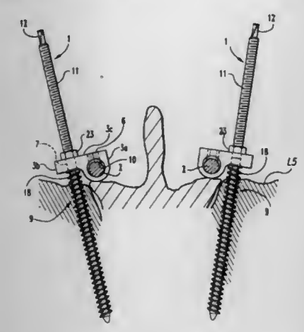
PCT No. PCT/US93/10966, § 371 Date May 10, 1995, § 102(e) Date May 10, 1995, PCT Pub. No. WO94/10928, PCT Pub. Date May 26, 1994

PCT Filed Nov. 12, 1993, Ser. No. 436,192

Claims priority, application France, Nov. 13, 1992, 9213694

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—61 **5 Claims**



1. A spinal fixation system, comprising:

an elongated rod configured for attachment along a posterior aspect of a patient's spine, a set screw, and a nut;

a pedicular screw having a first screw thread and a second screw thread, said first thread being configured for penetration into a posterior pedicular region of the patient's spine, said second thread being separated from said first thread by a bearing shoulder therebetween, said second thread being configured to extend outside the pedicular region when penetrated by said first thread;

a connection element having a generally L-shaped profile defining a rod bore receiving said rod therethrough and a threaded bore intersecting said rod bore, said set screw being threaded into said threaded bore to correspondingly clamp said rod to said element, said element having two opposed planar surfaces defining an opening configured to receive said pedicular screw therethrough, said opening having a cylindrical central part extended at both ends by conical parts each opening out onto a respective one of said planar surfaces, said element bearing against said shoulder of said pedicular screw, said nut being threaded on said second thread of said pedicular screw fastening said pedicular screw to said element; and

wherein said set screw is positioned anterior to said nut to provide a low profile construct when said rod and said pedicular screw are rigidly interconnected by said element.

5,814,047

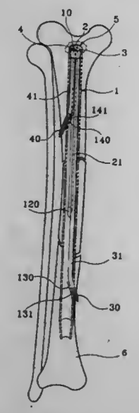
INTRAMEDULLARY NAIL FIXATION APPARATUS AND ITS FIXATION METHOD

Tze-Hong Emilio, Keelung; Shan-Chang Chueh, Taipei; Ting-Hui Chiu; Chi-Ming Shih, both of Hsinchu; Chung-An Wu, Chia-Yi, and Cheng-Kung Cheng, Taipei Hsien, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Mar. 4, 1997, Ser. No. 805,910

Int. Cl.[6] A61B *17/72*

U.S. Cl. 606—62 **9 Claims**



1. An intramedullary nail fixation apparatus comprising:

an intramedullary nail for insertion into a marrow cavity of a bone, said intramedullary nail comprising a center through hole extending longitudinally along the intramedullary nail, and at least one piercing point opening communicating with the center through hole; and

at least one flexible screw mounted in and extending along at least a portion of the center through hole of said intramedullary nail, each flexible screw comprising a rounded stem and a self-tapping screw tip at one end of said rounded stem, said self-tapping screw tip extending out of said intramedullary nail through the at least one piercing point opening and enabling the self-tapping screw tip to be threaded into a wall of a bone in which the intramedullary nail is located upon rotation of the respective flexible screw.

5,814,048

CRANIOPLASTY PLATES AND METHOD OF INSTALLATION

Frank H. Morgan, Las Vegas, Nev., assignor to Sofamor Danek Properties, Inc., Memphis, Tenn.

Filed May 3, 1996, Ser. No. 642,648

Int. Cl.[6] A61B *17/80*

U.S. Cl. 606—69 **12 Claims**

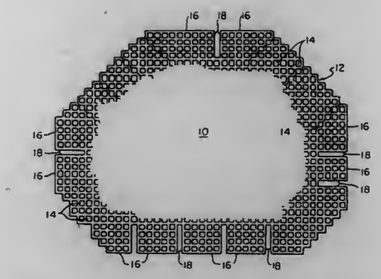
1. A cranioplasty plate for use in the repair and recontour of large cranial defects in the human skull, comprising:

a sheet of perforated metallic material;

said sheet including pliable peripheral panels for bending fitment of said sheet to bone surrounding the cranial defect; and

said sheet having a central arcuate and convex portion with substantially increased rigidity in comparison to said pliable peripheral panels, said central portion configured to approximate the normal bone structure of a large cranial defect and to protect underlying tissue;

wherein said sheet has a thickness in the range of about 0.5 mm to about 1.5 mm and includes uniform parallel rows and uniform parallel lines of perforations, said parallel lines of perforations being arranged generally perpendicular to said parallel rows of perforations.



5,814,049

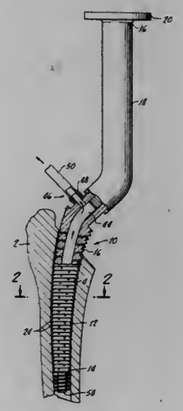
PROCESS FOR APPLYING SUCTION TO BONE DRILLING AND REAMING OPERATIONS

Clyde Pratt, Somis, and Roger Carignan, Camarillo, both of Calif., assignors to Kinamed, Inc., Newbury Park, Calif.

Filed Oct. 27, 1995, Ser. No. 549,482

Int. Cl.[6] A61B *17/16*

U.S. Cl. 606—80 **14 Claims**



2. A cutting tool comprising:

a. a stem;

b. cutting teeth extending outward from the stem, the cutting teeth having a cutting edge and a back side;

c. a central passage at least partially through the stem,

d. an evacuation line connected to the central passage; and

e. a tube extending from the back side of at least one cutting tooth to the central passage.

5,814,050

HIP OFFSET-INSET APPARATUS AND METHOD

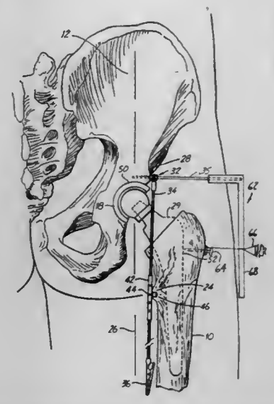
Gail M. Benson, Sioux Falls, S. Dak., assignor to Bentwood Place, Inc., Sioux Falls, S. Dak.

Continuation-in-part of Ser. No. 250,164, May 27, 1994, which is a division of Ser. No. 882,938, May 14, 1992, Pat. No. 5,318,571. This application Jun. 7, 1995, Ser. No. 474,401

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—102 **15 Claims**

1. An offset-inset apparatus useful in combination with a hip length device, the hip length device being adapted to determine pre- and post-replacement length distances between first and second fixed points along an exposed hip joint, the offset-inset apparatus being adapted to determine pre- and post-replacement distances between one or more other fixed points on the joint and corresponding reference points positioned with respect to the joint, the apparatus comprising an acetabular attachment attachable to the superior eminence of the acetabulum, a femoral attachment capable of being fixed to the femur at approximately the position of the greater trochanter, and a measuring device for measuring and noting distances between the reference points and the other fixed points, wherein the measuring device comprises a rod adapted to be attached to the acetabular attachment to provide fixed reference points with respect to the joint, and a gauge for measuring distances between the reference points and one or more fixed points on the acetabulum or femur.



5,814,051

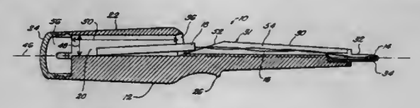
SUTURE ANCHOR INSERTION SYSTEM

Richard F. Wenstrom, Jr., Norwood, Mass., assignor to Mitex Surgical Products, Inc., Westwood, Mass.

Filed Jun. 6, 1997, Ser. No. 870,856

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—104 **24 Claims**



1. A suture anchor insertion system, comprising:

an elongate handle having a proximal end, a distal end and a side wall disposed between the proximal and distal ends;

an elongate suture anchor inserting member extending from the distal end of the handle and having a suture anchor seating element at a distal end thereof, the suture seating element being effective to releasably seat a suture anchor; and

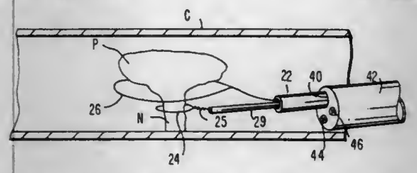
a retaining chamber integral with the side wall of the handle, the retaining chamber having an opening facing substantially toward the distal end of the handle.

VOL 1214 ISS 5 SEP 29 1998 UMI

5,814,052
SURGICAL CAUTERIZATION SNARE WITH LIGATING SUTURE

Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022, and Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Filed Jun. 29, 1995, Ser. No. 496,574
Int. Cl.[6] A61B *17/24*
U.S. Cl. 606—115 29 Claims



1. A surgical instrument assembly for use in snare cauterization procedures comprising:

a first tubular sheath member;

loop means for forming a cauterization loop which is alternatively expandable and contractible in essentially a single plane, a proximal end of said loop means configured to operatively mate with an electrically conductive wire passing longitudinally through said first tubular sheath to electrical supply means for supplying a current to said loop means;

a second tubular sheath member slidably disposed in the first tubular sheath member;

a flexible suture member releasably connected to the loop means, a distal end of the suture member forming a one-way slip knot and a proximal end of the suture member disposed in the distal end the second tubular sheath;

an actuator module associated with the proximal end of the second tubular sheath for advancing said second tubular sheath distally with respect to the distal end of the first tubular sheath;

elongate tensioning means releasably joined to the proximal end of the suture member and disposed in the second tubular sheath, a proximal end of the tensioning means joined to the actuator module where the second tubular sheath and tensioning means cooperate to advance said slip knot on the suture member.

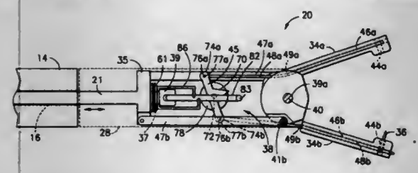
5,814,053

Patent Not Issued For This Number

5,814,054
AUTOMATIC NEEDLE-PASSER SUTURING INSTRUMENT

Juergen Andrew Kortenbach, Miami Springs; Robert Sixto, Jr., and Michael Sean McBrayer, both of Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Filed Sep. 23, 1996, Ser. No. 718,019
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—139 22 Claims



1. A suturing instrument for use in conjunction with a needle, comprising:

a) a flexible tubular member having a distal end;

b) an actuation means extending through said tubular member, said actuation means having a handle means and one of a control wire and a push rod, said handle means being coupled to said one of said control wire and said push rod for moving said one of said control wire and said push rod relative to said tubular member;

c) first and second stitching end effectors coupled to said tubular member, at least one of said first end second stitching end effectors adapted to move relative to the other, said first and second stitching end effectors having a releasable needle gripping means for releasably gripping the needle; and

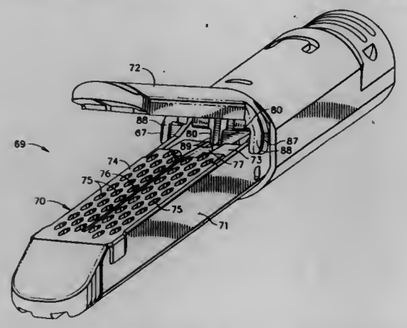
d) an automatic needle switching means coupled to said needle gripping means and activated by said actuation means,

wherein said first and second stitching end effectors are adapted to be movable from a first position to a second position to a third position to a fourth position and back to said first position, and in said first position said first and second stitching end effectors are in an open position and said first end effector is adapted to grip the needle, in said second position said first and second stitching end effectors are in a closed position and said first end effector is adapted to automatically release the needle and said second end effector is adapted to automatically grip the needle, in said third position said first and second stitching end effectors are in said open position and said second end effector is adapted to grip the needle, and in said fourth position said first and second stitching end effectors are in said closed position and said first end effector is adapted to automatically grip the needle and said second end effector is adapted to automatically release the needle.

5,814,055
SURGICAL CLAMPING MECHANISM

Bryan D. Knodel, Cincinnati; J. David Hughett, Hamilton, and Anil K. Nalagatla, West Carrollton, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 530,931, Sep. 19, 1995. This application Sep. 12, 1996, Ser. No. 713,055
Int. Cl.[6] A61B *17/08*
U.S. Cl. 606—151 3 Claims

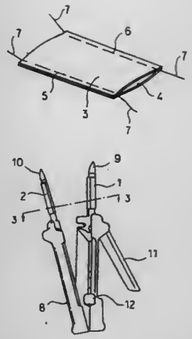


1. A surgical stapling instrument comprising:

a) an elongated staple cartridge having a cartridge clamping surface thereon, and a cartridge alignment surface thereon at a proximal end thereof adjacent said cartridge clamping surface, said cartridge alignment surface containing an alignment groove embedded therein; and

b) an elongated anvil having: i) an anvil clamping surface thereon facing said cartridge clamping surface, ii) an anvil alignment surface thereon at a proximal end thereof adjacent said anvil clamping surface, said anvil alignment surface containing a pair of spaced-apart alignment ribs protruding therefrom, each of said alignment ribs having a rib leading edge thereon, and iii) a pair of outboard tissue stops extending therefrom at a proximal end of said anvil clamping surface, each of said outboard stops having a stop leading edge thereon located distally of each of said rib leading edges;

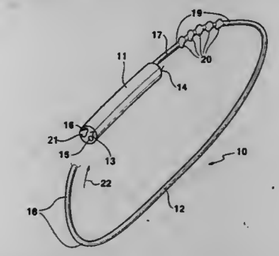
wherein said elongated anvil is movable relative to said elongated staple cartridge from a rearward position in which said cartridge and anvil clamping surfaces are spaced from each other for insertion of tissue therebetween to a forward position in which said outboard tissue stops straddle said elongated cartridge adjacent a proximal end of said cartridge clamping surface and said cartridge and anvil clamping surfaces are adjacent to each other for clamping the tissue, and when said elongated tissue is moved from said rearward to said forward positions, said alignment ribs on said anvil alignment surface are received into and slide within said alignment groove in said cartridge alignment surface.



5,814,056
SEAL

Rüdiger L. Prosst, Tübingen; Klaus Roth, Ofterdingen; Gerhard Buess, and Marc O. Schurr, both of Tübingen, all of Germany, assignors to Willy Rüsch AG, Kernen-Rommelshausen, Germany

Filed Jan. 30, 1997, Ser. No. 790,663
Claims priority, application Germany, Jul. 18, 1996, 196 28 909.2
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—151 8 Claims



1. A seal comprising:

a bushing made from a flexible material and having a first lumen with a first lumen diameter, said bushing also having a second lumen with a second lumen diameter; and

a thread having a free end section with a diameter smaller than said second lumen diameter, said free end section passing through said second lumen, said free end section having an end securely connected to said bushing, said thread also having a first length with a diameter smaller than said first lumen diameter and said thread having a second length with enlargements, said enlargements having a diameter larger than said first lumen diameter, wherein said bushing deforms under the application of a force caused by said thread when said first length is pulled through said first lumen.

5,814,057
SUPPORTING ELEMENT FOR STAPLE REGION

Shigeo Oi; Hiroshi Ohshima, and Satoshi Hashimoto, all of Ayabe, Japan, assignors to Gunze Limited, Ayabe, Japan

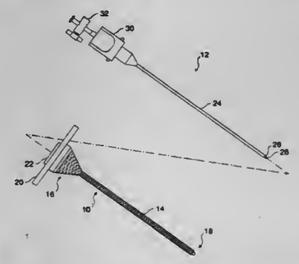
Continuation of Ser. No. 456,574, Jun. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 434,989, May 4, 1995, abandoned. This application Mar. 28, 1997, Ser. No. 825,457
Claims priority, application Japan, Jun. 3, 1994, 6-156353
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—151 5 Claims

1. A supporting element having a cylinder or prism shape for staple region comprising a fabric-like object made of biodegradable and bioabsorbable material integrated with stretchable textile at both ends, wherein said biodegradable and bioabsorbable material is at least one selected from the group consisting of polyglycolic acid, polylactic acid, copolymer or mixture of polyglycolic acid and polylactic acid, para-dioxanone, polycaprolactone and chitin, and wherein said stretchable textile is stretch warp knit.

5,814,058
METHOD AND APPARATUS EMPLOYING CONFORMABLE SLEEVE FOR PROVIDING PERCUTANEOUS ACCESS

John Carlson, Mountain View; Craig K. Tsuji, Santa Clara; Steven P. Masterson, San Francisco, and Michael J. Orth, Morgan Hill, all of Calif., assignors to Innerdyne, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 424,696, Apr. 19, 1995, which is a division of Ser. No. 26,922, Mar. 5, 1993, Pat. No. 5,431,676. This application Aug. 14, 1996, Ser. No. 696,755
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—185 63 Claims



1. A method for percutaneously introducing an article, said method comprising:

percutaneously inserting a conformable sleeve to a target site in a body cavity;

passing an article from outside the body and through a lumen of the conformable sleeve, wherein passage of the article radially expands the lumen as the article advances; and

grasping the article with graspers and pulling the article away from the sleeve with the graspers into the body cavity.

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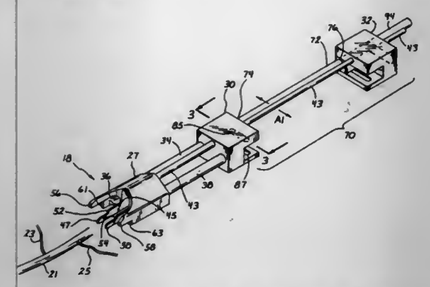
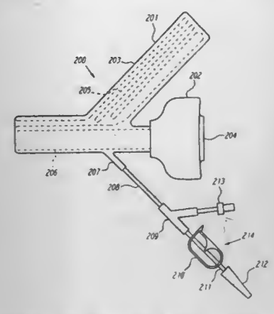
5,814,059
VEIN-BRANCH ACCESSING DEVICE
Charles C. Hart, Huntingdon Beach, and Eric Lee, Irvine, both of Calif., assignors to Applied Medical Resources Corporation, Laguna Hills, Calif.
Filed Jan. 8, 1997, Ser. No. 780,982
Int. Cl.[6] A61B *17/00;17/22;17/32;17/10*
U.S. Cl. 606—190 **65 Claims**



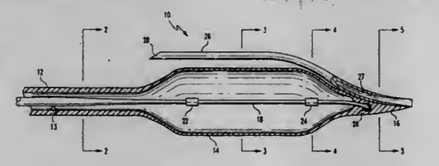
7. A vein-branch accessing device for accessing vein branches of a vein, the vein-branch accessing device, comprising:
at least one probe adapted for contacting a surface of the vein and for moving along the surface of the vein, to thereby guide the vein-branch accessing device over the surface of the vein;
a vein branch indicator adapted for indicating to an operator of the vein-branch accessing device that the probe has moved along the surface of the vein to a vein branch of the vein;
accessing means adapted for facilitating access to the vein branch of the vein, the accessing means being sized and configured to receive a cutter therethrough, the cutter being adapted for severing the vein branch from the vein; and
the at least one probe including a vein bed separator comprising a shovel-shaped blade.

5,814,060
EXTRALUMINAL BALLOON DISSECTION
Thomas J. Fogarty; George D. Hermann, both of Portola Valley; Jan M. Echeverry, San Jose, and Kenneth H. Mollenauer, Los Gatos, all of Calif., assignors to General Surgical Innovations, Inc., Cupertino, Calif.
Continuation of Ser. No. 631,221, Apr. 11, 1996, Pat. No. 5,690,668, which is a continuation-in-part of Ser. No. 267,484, Jun. 29, 1994, Pat. No. 5,601,589. This application Mar. 26, 1997, Ser. No. 824,676
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—192 **32 Claims**



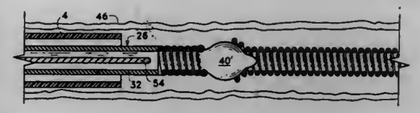
1. An apparatus for dissection along a natural tissue plane comprising:
a housing having proximal and distal ends, said housing for receiving instruments;
an instrument seal mounted in said housing to provide a substantially fluid-tight seal between the interior of said housing and an instrument introduced therein;
a tubular sleeve extending from said housing, said tubular sleeve having a proximal end connected to the distal end of said housing;
an elongate balloon having a proximal end sealingly terminated between the interior of said housing and the exterior of said tubular sleeve, said elongate balloon comprising:
a laterally extending reservoir;
an outwardly expandable distal portion folded inside said reservoir; and
an inflation harness for introducing an inflation medium into said elongate balloon.

5,814,061
RAPID EXCHANGE STENT DELIVERY BALLOON CATHETER
Thomas A. Osborne, and Scott E. Eells, both of Bloomington, Ind., assignors to Cook Incorporated, Bloomington, Ind.
Continuation of Ser. No. 582,338, Jan. 18, 1996, Pat. No. 5,690,642. This application Jun. 16, 1997, Ser. No. 876,838
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—194 **15 Claims**



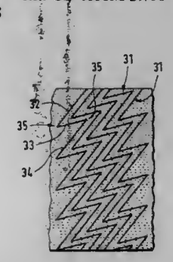
1. A method of making a rapid exchange stent delivery balloon catheter, comprising the steps of:
a) providing a first length of first tubing having a first lumen, a proximal end and a distal end;
b) closing the first tubing distal end;
c) providing a first mold having interior dimensions substantially equal to desired balloon dimensions;
d) placing a portion of the first tubing into the first mold;
e) heating the portion of the first tubing in the first mold;
f) pressurizing the first lumen such that the portion of the first tubing in the first mold expands to the interior dimensions of the first mold, thereby forming a balloon;
g) cooling the portion of the first tubing in the first mold such that the portion of the first tubing in the first mold retains a shape of the interior of the first mold;
h) removing the first tubing from the first mold;
i) cutting the first tubing distal end at a point distal to a distal end of the balloon;
j) providing a second length of second tubing having a second lumen, a proximal end and a distal end;
k) inserting a mandrel into the second lumen at least adjacent the second tubing distal end;
l) placing the first tubing distal end and the second tubing distal end adjacent one another in a second mold; and
m) heating the first and second tubing distal ends until they bond together to form a catheter tip, thereby bonding the second tubing to the first tubing only at the first tubing distal end completely distal of the distal end of the balloon.

5,814,062
IMPLANT DELIVERY ASSEMBLY WITH EXPANDABLE COUPLING/DECOUPLING MECHANISM
Ivan Sepetka, Los Altos, and U. Hiram Chee, San Carlos, both of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.
Filed Dec. 22, 1994, Ser. No. 363,264
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **26 Claims**



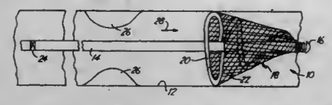
25. An occlusive implant delivery assembly for occluding a site in a mammal, said assembly comprising:
an occlusive implant having a tubular portion;
a pusher having a proximal section and a distal section;
an inflatable member having a first portion coupled to said distal section of the pusher and a second portion frictionally held in said tubular portion when deflated such that during inflation of said inflatable member, said implant separates from said pusher; and
a core member that extends within said pusher and into said inflatable member, said core member being sized to urge said inflatable member against said tubular portion.

5,814,063
STENT FOR PLACEMENT IN A BODY TUBE
Lutz Freitag, Hemer, Germany, assignor to Willy Rusch AG, Kernen, Germany
Continuation of Ser. No. 517,023, Aug. 18, 1995. This application Nov. 27, 1996, Ser. No. 758,216
Claims priority, application Germany, Dec. 23, 1994, 44 46 036.8
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **15 Claims**



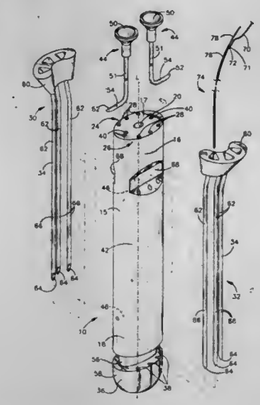
1. A stent for placement in a body tube, the stent comprising a hollow cylindrical casing having a longitudinal axis, a flexible support structure embedded in the casing, the casing being of a synthetic material which is elastic to a limited extent at least at body temperature, the support structure comprising a plurality of zig-zag-shaped wires, the wires extending parallel to the longitudinal axis of the casing and being offset relative to each other in circumferential direction of the casing, wherein each wire has at least three legs including a middle leg and two adjoining legs, wherein the middle leg includes an acute angle with each of the adjoining legs, the two adjoining legs having outer ends and inner ends connected to the middle leg in points of connection, wherein the acute angle is smaller than 45°, whereby a pressure applied in radial direction causes the points of connection to be rotated and moved in opposite directions such that the movements cancel each other out while the outer ends remain stationary, so that a total length of each wire and of the stent remains constant in axial direction when a pressure is applied in radial direction.

5,814,064
DISTAL PROTECTION DEVICE
John M. K. Daniel, Hopkins; Robert L. Cassell, Otsego, and David J. Holtan, Rogers, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.
Filed Mar. 6, 1997, Ser. No. 810,825
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—200 **20 Claims**



1. An emboli capturing system for introduction into vasculature to capture emboli in blood flowing in the vasculature, the emboli capturing system comprising:
a guidewire having a longitudinal axis and defining a lumen along at least a portion thereof;
an expandable member coupled to a distal portion of the guidewire and having an interior being in fluid communication with the lumen in the guidewire, the expandable member being configured to receive fluid through the lumen to expand radially outwardly relative to the guidewire and have fluid removed from the interior thereof to collapse radially inwardly relative to the guidewire, the expandable member, when expanded, having a spaced portion thereof spaced radially outwardly from the guidewire; and
an emboli capturing device operably coupled to the expandable member and configured to deploy radially outwardly relative to the guidewire upon expansion of the expandable member.

5,814,065
SUTURE DELIVERY TOOL
Roberto Diaz, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.
Filed Feb. 9, 1996, Ser. No. 599,063
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—213 **18 Claims**



1. An apparatus for closing a wound in a vessel wall of a patient, comprising
an elongated member having a proximal end portion and a distal end portion spaced from the proximal end portion along a longitudinal axis and having a distal end face, first needle lumens extending in said elongated member between the proximal end portion and the distal end portion,
a tip disposed near the distal end portion of said elongated member and including second needle lumen portions aligned with said first needle lumens, said tip being spaced apart from

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said distal end face of said elongated member along the longitudinal axis to form a recess between said tip and said distal end face for receiving the vessel wall,

at least two locker needle lumens extending between the proximal end portion and the distal end portion each having an outlet opening at an exterior surface of said elongated member, and

at least two locker needles each disposed in an associated one of said locker needle lumens and having a shape effective to penetrate tissue of the patient,

wherein each said outlet opening is spaced a distance above said tip and each said locker needle lumen has a portion that extends to said outlet opening at an angle with respect to the longitudinal axis, said distance and said angle being effective to prevent said locker needle from contacting the vessel wall of the patient.

5,814,066

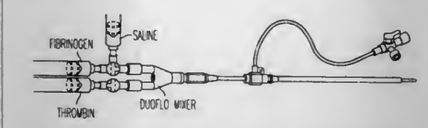
REDUCTION OF FEMORAL ARTERIAL BLEEDING POST CATHETERIZATION USING PERCUTANEOUS APPLICATION OF FIBRIN SEALANT

William D. Spotnitz, Charlottesville, Va., assignor to The University of Virginia Patent Foundation, Charlottesville, Va.

Filed Dec. 23, 1994, Ser. No. 362,868

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—214 **6 Claims**



1. A method for reducing arterial bleeding following arterial catheterization of a patient, comprising introducing fibrin sealant to periarterial tissue adjacent an arteriotomy site in which a catheter has been inserted, withdrawing said catheter at the same time said fibrin sealant is introduced and allowing said fibrin sealant to form a fibrin seal, wherein precursors of said fibrin sealant are separately introduced into a conduit with an opening at said periarterial tissue, such that said fibrin sealant precursors are mixed prior to delivery to said periarterial tissue.

5,814,067

SKIN PINCHING DEVICE

Wim Fleischmann, Nelkenweg 15, D-89182 Bernstadt, Germany

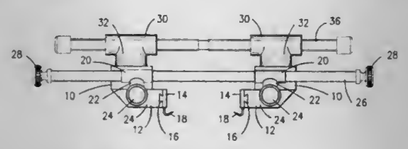
PCT No. PCT/DE95/01766, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO96/18345, PCT Pub. Date Jun. 20, 1996

PCT Filed Dec. 11, 1995, Ser. No. 860,006

Claims priority, application Germany, Dec. 12, 1994, 44 44 130.4

Int. Cl.[6] A61B *17/08*

U.S. Cl. 606—218 **13 Claims**



1. A skin pinching device comprising:

at least a pair of jaws,

adjustment means for adjusting the spatial separation of the jaws with respect to each other, and

two or more removable modules provided on each of said jaws, said modules capable of being sequentially assembled modularly on said laws so as to engage a guide channel (16) running in each jaw perpendicularly to the direction of adjustment, each of said modules including one or more hooks designed for sticking into skin, each jaw thereby forming a row of hooks.

5,814,068

SUTURE THREAD FOR INTRACARDIAC SUTURE OPERATION

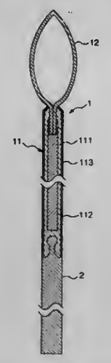
Kazuyuki Koike, Tokyo-to; Yoshikazu Kishigami; Katsuya Miyagawa, both of Ohsu, and Syu Kurashima, Shiga-ken, all of Japan, assignors to Nissho Corporation, Osaka-fu, Japan

Filed Jun. 13, 1997, Ser. No. 874,734

Claims priority, application Japan, Jun. 20, 1996, 8-159471

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—228 **3 Claims**



1. A suture thread for intracardiac suture operation, which comprises a thread guide element and a thread joined to a rear end thereof, said thread guide element being composed of a slender straight member of a super-elastic alloy wire and a looped member of a super-elastic alloy wire provided at a front end of the straight member, said straight member having the outermost layer of a coating of a lubricating material.

5,814,069

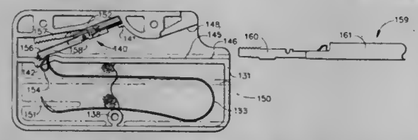
LOAD ASSIST DEVICE FOR A SUTURE CARTRIDGE

Dale R. Schulze, Lebanon; Norman D. Crawford, Washington Court House, and John V. Hunt, Cincinnati, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 841,962, Apr. 8, 1997. This application Jun. 25, 1997, Ser. No. 882,506

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—228 **14 Claims**



1. A load assist device for facilitating the loading of a suture cartridge onto a cartridge carrier of a surgical instrument, said device comprising:

a) a cartridge casing having:

i) an interior cartridge storage space therein,

ii) a carrier aperture, and

iii) an interior carrier channel defining a passageway between said carrier aperture and said storage space; and

b) a suture cartridge loaded into said interior storage space of said cartridge casing, said cartridge containing a suture filament for tying a knot during a surgical procedure and a jaw movable from an open position to a closed position;

wherein the cartridge carrier of the surgical instrument may be inserted into said carrier aperture for passage through said carrier channel in a loading direction to said cartridge storage space for loading said suture cartridge onto the cartridge carrier, and the loaded cartridge carrier may be withdrawn from said cartridge storage space for passage through said carrier channel in an unloading direction for withdrawal from said carrier aperture.

5,814,070

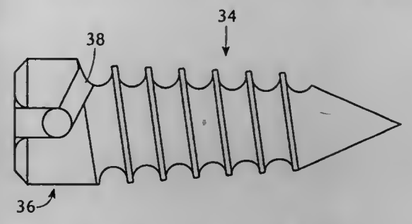
SUTURE ANCHOR AND DRIVER

Rocco R. Borzone, Emerson; John S. Crombie, East Hanover, both of N.J., and David L. Nelson, San Francisco, Calif., assignors to Howmedica Inc., New York, N.Y.

Filed Feb. 20, 1996, Ser. No. 603,478

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—232 **24 Claims**



1. A suture anchor and driver device comprising:

a suture anchor, said anchor comprising a proximal end for insertion into bone tissue, a central threaded portion, and a distal end of generally cylindrical shape having a diameter through a central axis, wherein said distal end is adapted to define a passage along the diameter of said distal end, and is further adapted to engage a driver;

a driver having a proximal end releasably engaged with the distal end of said suture anchor, and an elongated central portion with a substantially cylindrical outer surface;

wherein said suture anchor and driver are adapted to define a suture path along the outside surface of said driver in a longitudinal fashion, along the passage defined by the distal end of said suture anchor, and returning along the outside surface of said driver in a longitudinal fashion; and

wherein the distal end of the suture anchor has a first cross-sectional area and the central portion of the driver has a third cross-sectional area, and wherein said first cross-sectional area is greater than said third cross-sectional area.

5,814,071

SUTURE ANCHOR ASSEMBLY AND METHODS

Dennis McDevitt, Upton, and John Rice, Lincoln, both of Mass., assignors to Innovasive Devices, Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 337,944, Nov. 10, 1994, Pat. No. 5,649,963, Ser. No. 568,348, Dec. 6, 1995, and Ser. No. 574,463, Dec. 7, 1995, Pat. No. 5,643,321. This application Sep. 25, 1996, Ser. No. 719,659

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—232 **32 Claims**

1. A suture anchor assembly, comprising:

a tubular anchoring element having defined therein an axial channel for loading onto a stem and having a distal end for engagement with a distal end of the stem, the anchoring element including inner and outer peripheral surfaces forming a wall therebetween, the wall having defined therein a plurality of axially-oriented slots in communication with the axial channel, the slots beginning at a proximal end of the element and extending distally, wherein the plurality of slots further define a plurality of flexible wall sections disposed between adjacent, axially-oriented slots;

a tubular expander element having defined therein an axial channel, the expander element for loading onto the stem and having a distal end for engagement with the proximal end of the tubular anchoring element, wherein the tubular anchoring element is adapted for proximal movement within a bone hole from a first position, where a proximal end thereof is engaged with the distal end of the expander element, to a second position, where the proximal end of the tubular anchoring element cams over the distal end of the expander element so that flexible wall sections expand into a wall of the bone hole; and

a suture retainer coupled to the anchoring element and disposed such that an under-tension suture therein places the suture retainer in compression.

5,814,072

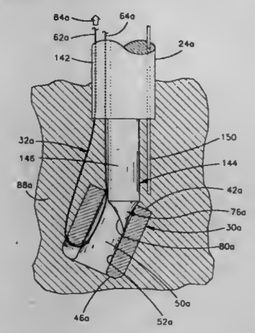
METHOD AND APPARATUS FOR USE IN ANCHORING A SUTURE

Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401

Filed Nov. 15, 1996, Ser. No. 752,005

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—232 **129 Claims**



1. A method of positioning a suture anchor in body tissue, said method comprising the steps of providing an anchor which has a

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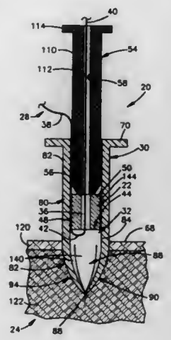
passage which extends between first and second surface areas on the anchor, providing an inserter having an end portion and a pusher surface which is spaced from the end portion, and moving the anchor and inserter together into body tissue with the end portion of the inserter extending into the passage in the anchor and the pusher surface on the inserter engaging the second surface area on the anchor, said step of moving the anchor and inserter together into the body tissue includes transmitting force from the pusher surface on the inserter to the second surface area on the anchor.

5,814,073

METHOD AND APPARATUS FOR POSITIONING A SUTURE ANCHOR

Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401

Filed Dec. 13, 1996, Ser. No. 764,199
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 **51 Claims**



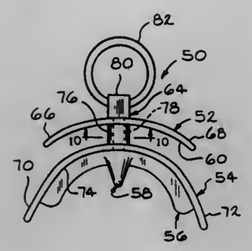
46. An apparatus comprising an anchor, a suture having a connector section which extends through said anchor, said suture having first and second leg sections which are connected with said connector section, a tubular member through which said anchor is movable, said first and second leg sections of said suture extend from a first end portion of said tubular member with at least one of said leg sections being at least partially disposed between an outer side surface on said anchor and an inner side surface on said tubular member, and a pusher member which is at least partially disposed in said tubular member and along which said first and second leg sections of said suture extend from said tubular member, said tubular member having a second end portion which is operable from a closed condition blocking movement of said anchor through said second end portion of said tubular member and an open condition in which said second end portion of said tubular member is ineffective to block movement of said anchor into body tissue with said first and second leg sections of said suture extending from said anchor, said pusher member having leading end surface means for applying force against a trailing end of said anchor to press a leading end of said anchor against said second end portion of said tubular member to operate said second end portion of said tubular member from the closed condition to the open condition under the influence of force transmitted from said pusher member through said anchor to said second end portion of said tubular member while said one of said leg sections of said suture is at least partially disposed between said outer side surface on said anchor and said inner side surface on said tubular member, said end portion of said tubular member includes a plurality of segments, each of said segments having an inner surface, an outer surface and a plurality of side surfaces which extend between said inner and outer surfaces, said side surfaces on each of said segments being disposed adjacent to side surfaces on adjacent segments when said end portion of said tubular member is in the closed condition, said outer surfaces on said segments cooperating to form a pointed end of said tubular member when said second end portion of said tubular member is in the closed condition, said pointed end of said tubular member having surface means for piercing an imperforate surface area on body tissue.

5,814,074

ORAL APPLIANCE FOR INFANTS AND TODDLERS

Stephen Branam, 5338 Radcliffe Rd., Sylvania, Ohio 43560

Filed Jul. 23, 1996, Ser. No. 685,305
Int. Cl.[6] A61J *17/00*
U.S. Cl. 606—234 **5 Claims**



1. An oral appliance for a toddler, the appliance comprising

a shield which is adapted and configured to be positioned between a toddler's upper and lower gums, on the one hand, and the toddles cheeks, on the other hand, said shield having left and right wings and a rear surface which generally conforms to the shape of the outside surfaces of a toddler's upper and lower gums, and is rigid enough to substantially resist deformation under pressure from the cheeks caused by mouth suction,

a bite ridge having first and second ends, said bite ridge being connected to and extending from said shield so that it is received between gums or erupted teeth when the appliance is in use and said bite ridge being tapered from a given thickness adjacent said connector to a thickness of substantially one-third of the given thickness at each of said first and second ends, and

a nipple element connected to and supported on said inner shield and extending a short distance from the inner shield into a toddler's mouth when the appliance is in use.

5,814,075

METHOD AND APPARATUS FOR OPTIMIZING SOURCE ALLOCATION WITHIN AN IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR

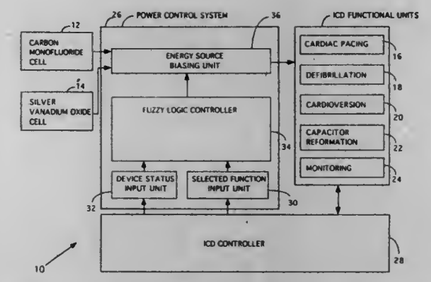
Mark W. Kroll, Simi Valley, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Jun. 17, 1997, Ser. No. 877,046
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **24 Claims**

1. In an implantable medical device having two or more different energy sources for powering two or more different device functions, a power control system comprising:

means for receiving signals representative of an operational status of the implantable medical device;

means for biasing relative amounts of energy drawn from the two or more different energy sources; and



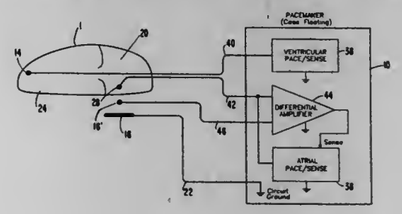
means for controlling the means for biasing to gradually vary the relative amounts of energy drawn from the two or more different energy sources based upon the signals representative of the operational status of the implantable medical device.

5,814,076

APPARATUS FOR IMPROVED CARDIAC PACING AND SENSING USING EXTRACARDIAC INDIFFERENT ELECTRODE CONFIGURATIONS

Robert R. Brownlee, Ormond Beach, Fla., assignor to Cardiac Control Systems, Inc., Palm Coast, Fla.

Filed Feb. 9, 1996, Ser. No. 594,887
Int. Cl.[6] A61N *1/362*
U.S. Cl. 607—9 **11 Claims**



6. An apparatus for sensing electrical heart signals and for applying a pacing signal across the heart muscle of a person, said apparatus comprising:

a pacemaker constructed to be implanted in said person;

a first intracardiac catheter connected to said pacemaker and including a first intracardiac electrode positioned in a predetermined chamber of the heart; and

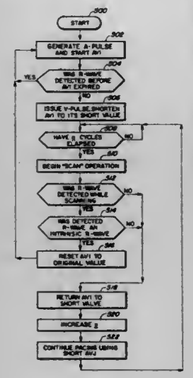
a first extracardiac catheter connected to said pacemaker and including a first indifferent electrode thereon, said first extracardiac catheter having a length which enables said indifferent electrode to be positioned subcutaneously on said person at a location which is remote from said pacemaker and reduces myopotential sensing.

5,814,077

PACEMAKER AND METHOD OF OPERATING SAME THAT PROVIDES FUNCTIONAL ATRIAL CARDIAC PACING WITH VENTRICULAR SUPPORT

Jason A. Sholder, Beverly Hills; Paul A. Levine, Newhall; Joseph J. Florio, Sunland, and Gene A. Bornzin, Simi Valley, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 440,599, May 15, 1995, Pat. No. 5,741,308, which is a continuation-in-part of Ser. No. 225,226, Apr. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 219,065, Mar. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 976,153, Nov. 13, 1992, Pat. No. 5,334,220. This application May 12, 1997, Ser. No. 854,797
Int. Cl.[6] A61N *1/362*
U.S. Cl. 607—9 **20 Claims**



1. A method of controlling the operation of a dual-chamber electronic pacemaker, the pacemaker having pulse generating means for selectively generating an atrial stimulation pulse (A-pulse) and a ventricular stimulation pulse (V-pulse); timing means for generating specified time intervals, including an AV interval; sensing means for sensing selected cardiac events, including P-waves and R-waves; means for controlling the pulse generating means as a function of whether the sensing means senses certain prescribed events during a given time interval generated by the timing means, the method comprising:

(a) measuring an AR interval defined as a time interval between an atrial event and a sensed R-wave, the atrial event comprising either the generation of an A-pulse or the sensing of a P-wave;

(b) averaging the AR interval over a prescribed number of cardiac cycles to define a "learned" AR interval, the "learned" AR interval corresponding to a natural conduction time of the heart;

(c) determining whether an R-wave is naturally conducted by comparing the AR interval of an R-wave which occurs during an original AV interval with the "learned" AR interval, the original AV interval comprising a time interval generated by the timing means that commences with an atrial event and terminates a prescribed period of time thereafter;

(d) shortening the AV interval by a specified amount to produce a short AV interval whenever AV conduction is determined not to be present; and

(e) returning the AV interval to the original AV interval whenever AV conduction has returned, and keeping the AV interval at its short value whenever AV conduction has not returned.

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5,814,078

METHOD AND APPARATUS FOR REGULATING AND IMPROVING THE STATUS OF DEVELOPMENT AND SURVIVAL OF LIVING ORGANISMS

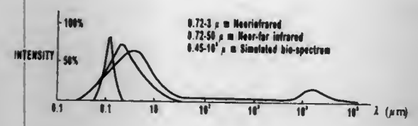
Lin Zhou, and Xue-shan Zhang, both of 21 Carlos Dr., Fairfield, N.J. 07006

Division of Ser. No. 827,636, Jan. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 508,302, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 103,808, Oct. 1, 1987, abandoned. This application Feb. 28, 1995, Ser. No. 395,042

Claims priority, application China, May 20, 1987, 87103603; May 20, 1987, 87208158

Int. Cl.[6] A61N *5/06*

U.S. Cl. 607—1 **1 Claim**



1. An apparatus for regulating and improving status of growth and survival of a living organism comprising:

energy generating means;

means for receiving energy generated by said energy generating means and for generating at least one of thermal and magnetic energy; and

a volume of a transducing material for generating a first electromagnetic radiation and a second electromagnetic radiation when excited by said at least one of thermal and magnetic energy produced by said means for receiving energy, the first radiation having a wavelength in range from about 0.2 μm to about 20 μm, and the second radiation having a wavelength in range from about 75,000 μm to about 100,000 μm, and wherein the means for generating the first electromagnetic radiation and the second electromagnetic radiation generates substantially no electromagnetic radiation having a wavelength in a range from about 20 μm to about 75,000 μm, said transducing material being substantially composed of:

one or a plurality of materials and compounds thereof selected from a group consisting of:

Co, Cu, Mo, Li, Be, BeO, Be_2C, Be_3N_2, B, B_2O_3, B_4C, BN, Mg, MgO, MgF_2, Al, Al_2O_3, Si, SiO_2, NbC, NbN, K, KO, Ca, CaO, Ti, TiO_2, TiC, TiN, TiB_2, V, V_2O_5, VC, VN, VB_2, Cr, Cr_3C_2, CrN, CrB, Cr_3B_4, Mn, MnO_2, MnF_2, Fe, Fe_2O_3, Ni, NiO, Zn, ZnO, ZnF_2, Ge, GeO, Sr, SrO, Zr, ZrO_2, ZrC, ZrN, ZrB_2, Nb, NbC, NbN, NbB_2, Ta, TaC, TaN, TaB_2, Hf, HfO_2, HfC, HfN, HfB, Se, Tn, TnO_2, TnC, TnN, TnB_4, TnB_6, W, WcW_2C, WB, Ce, CeO_2, Au, Y, and Y_2O_3, including a main constituent selected from the group consisting of chromium, magnesium, selenium, germanium, zinc, copper, manganese, aluminum, strontium, cerium, yttrium, calcium, titanium, cobalt, vanadium, molybdenum, silicon, iron, and compounds thereof, said main constituent constituting at least 50% of the content of said transducing material of said volume of transducing material.

5,814,079

CARDIAC ARRHYTHMIA MANAGEMENT BY APPLICATION OF ADNODAL STIMULATION FOR HYPERPOLARIZATION OF MYOCARDIAL CELLS

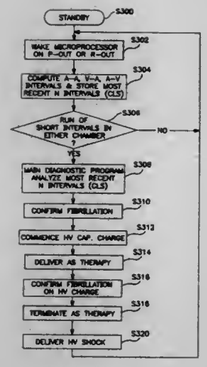
Robert S. Kieval, Golden Valley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 4, 1996, Ser. No. 720,886

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—4 **18 Claims**

8. An implantable pulse generator and lead system for managing tachyarrhythmias employing anodal stimulation energy applied to a heart chamber susceptible to tachyarrhythmia episodes comprising:



means for determining an anodal stimulation therapy delivery interval;

means for generating an anodal stimulation therapy having characteristics sufficient to hyperpolarize myocardial cells of the heart and insufficient to elicit depolarization of the myocardial cells; and

means for delivering the anodal stimulation therapy to the heart during the anodal stimulation delivery interval.

5,814,080

Patent Not Issued For This Number

5,814,081

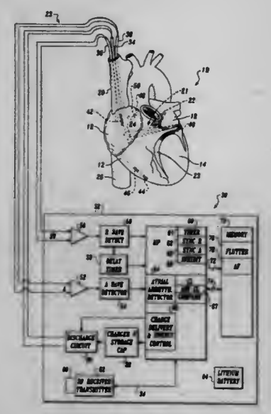
ATRIAL FLUTTER CARDIOVERTER AND METHOD

Gregory M. Ayers, Redmond, and John M. Adams, Issaquah, both of Wash., assignors to InControl, Inc., Redmond, Wash.

Filed Apr. 7, 1997, Ser. No. 835,169

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **12 Claims**



1. An atrial cardioverter for cardioverting atrial flutter comprising:

a lead system having a plurality of electrodes to deliver a cardioverting pulse to atria of a heart, for sensing A waves of the heart, and for sensing R waves of the heart;

an atrial flutter detector;

a first detector for detecting the A waves sensed by the lead system;

a second detector for detecting the R waves sensed by the lead system;

inhibit means for defining an inhibit time period responsive to each detected R wave; and

output means for providing the cardioverting pulse to the lead system when the heart is in atrial flutter and responsive to an A wave being detected, said inhibit means precluding provision of the cardioverting pulse during each inhibit time period.

5,814,082

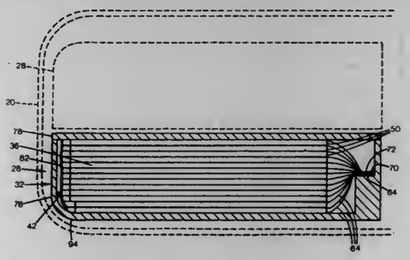
LAYERED CAPACITOR WITH ALIGNMENT ELEMENTS FOR AN IMPLANTABLE CARDIAC DEFIBRILLATOR

Timothy A. Fayram, Gilroy; Benjamin D. Pless, Atherton, both of Calif.; Samuel Parler, Clemson, S.C.; William H. Elias, and Scott McCall, both of Six Mile, S.C., assignors to Pacesetter, Inc., Sunnyvale, Calif.

Filed Apr. 23, 1997, Ser. No. 841,542

Int. Cl.[6] A61N *1/39;1/375*

U.S. Cl. 607—5 **26 Claims**



1. An implantable cardiac defibrillator comprising:

an outer housing defining a chamber;

an energy source within the outer housing;

a capacitor within the housing;

the capacitor comprising a capacitor housing and a plurality of flat, stacked, charge storing layers within the chamber;

the layers each including at least first and second sheets separated from each other by a separator sheet positioned therebetween;

the layers each having a periphery; and

the periphery of each layer having a minor portion comprising at least one alignment element, and wherein the second sheet extends beyond the first sheet at the alignment element.

5,814,083

PACEMAKER TACHY DETERMINATION BASED BLOCKED ON 2:1 SENSING

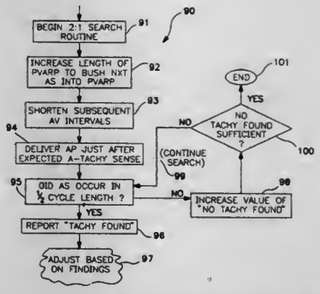
Michael F. Hess, Minneapolis, and H. Toby Markowitz, Roseville, both of Minn., assignors to Medtronic, Inc, Minneapolis, Minn.

Filed Sep. 29, 1995, Ser. No. 536,597

Int. Cl.[6] A61N *1/365*

U.S. Cl. 607—14 **13 Claims**

1. A method for determining if a long Post Ventricular Atrial Blanking period (PVAB) is blocking the sensing of every other atrial beat which may occur in a heart atrium (called "blocked 2:1 sensing") for use by a device which keeps data on time intervals between cardiac events for a living heart, such data at least including Atrial beat to Atrial beat time periods (A-A intervals),



and Atrial beat to Ventricular beat time period (AV intervals) as well as said PVAB, comprising the steps:

sensing in the atrium to determine A-A intervals,

determining (a) whether there is possible blocked 2:1 sensing by determining if said A-A interval is less than or equal to two times the sum of the AV interval plus the PVAB,

determining (b) whether one-half the A-A interval is less than a tachy interval, and if (a) and (b) are true, then

adjusting device parameters to accomplish a search cycle for determining whether in fact tachycardia is occurring during said possible blocked 2:1 sensing.

5,814,084

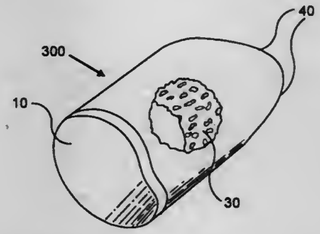
DIAPHYSIAL CORTICAL DOWEL

Nicholas E. Grivas, Charlotte, N.C., and James M. Grooms, Gainesville, Fla., assignors to University of Florida Tissue Bank, Inc., Alachua, Fla.

Filed Jan. 16, 1996, Ser. No. 587,070

Int. Cl.[6] A61F *2/28*

U.S. Cl. 623—16 **26 Claims**



1. A diaphysial cortical bone dowel comprising a transverse bone plug obtained from a transverse cut in the diaphysis of a long bone having an intra-medullary canal, said plug having a canal running therethrough, wherein said canal is defined by the intra-medullary canal of said long bone and wherein said plug retains the natural architecture surrounding said intra-medullary canal.

5,814,085

RATE STABILIZATION PACEMAKER

Michael R. S. Hill, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 16, 1997, Ser. No. 843,485

Int. Cl.[6] A61N *1/365*

U.S. Cl. 607—14 **18 Claims**

1. A cardiac pacemaker, comprising:

sensing means for sensing depolarizations of a heart,

pulse generating means for delivering pacing pulses to the heart; and

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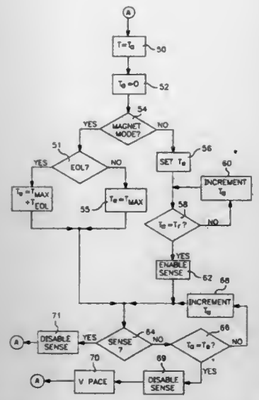


timing means responsive to said sensing means and coupled to said pulse generating means, said timing means defining escape intervals following sensed depolarizations and delivered pacing pulses and triggering said pulse generating means after expirations of the escape intervals;

cardiac cycle measuring means for measuring and storing durations of cardiac cycles; and

control means responsive to said sensing means for adjusting the escape interval determined by said timing means after a sensed depolarization, said control means adjusting the escape interval defined by said timing means to be equal to the duration of a first cardiac cycle measured by said cardiac cycle measuring means, immediately preceding said sensed depolarization, plus an increment of time determined by said control means based on the duration of a second cardiac cycle measured by said cardiac cycle measuring means, preceding the first cardiac cycle.

5,814,086

PEREX RESPIRATORY SYSTEM STIMULATION UPON TACHYCARDIA DETECTION

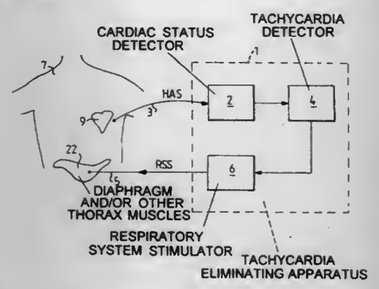
Jakub Hirschberg, Täby, and Hans Strandberg, Sundbyberg, both of Sweden, assignors to Pacesetter AB, Solna, Sweden

Filed Oct. 14, 1997, Ser. No. 950,138

Claims priority, application Sweden, Oct. 18, 1996, 9603841-9

Int. Cl.[6] A61N *1/38*

U.S. Cl. 607—14 **14 Claims**



1. A tachycardia eliminating apparatus comprising:

means for obtaining a cardiac activity signal from a patient;

cardiac status detecting means, supplied with said cardiac activity signal, for detecting a status of a cardiac system and for generating an output cardiac status signal;

tachycardia detecting means, supplied with said output cardiac status signal, for identifying at least one of impending tachycardia and established tachycardia and for generating an output tachycardia indication signal dependent on a deviation of said output cardiac status signal from a predetermined cardiac status; and

respiratory system stimulating means, supplied with said output tachycardia indication signal, for generating, in response to an indication of impending or established tachycardia, an output respiratory system stimulation signal for stimulating a respiratory system organ for producing a breathing rate corresponding to a predetermined heartbeat rate.

5,814,087

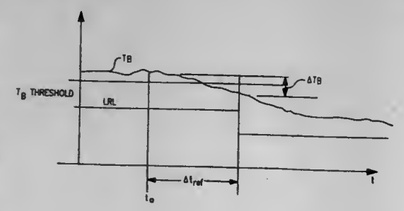
RATE RESPONSIVE PACEMAKER ADAPTED TO ADJUST LOWER RATE LIMIT ACCORDING TO MONITORED PATIENT BLOOD TEMPERATURE

Alexis C. M. Renirie, Berg en Dal, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 18, 1996, Ser. No. 768,604

Int. Cl.[6] A61M *1/36*

U.S. Cl. 607—21 **15 Claims**



1. A rate responsive pacemaker, having a controllable pulse generator for delivering pacing pulses, rate means for sensing at least one parameter containing information indicative of desired pacing rate and control means for controlling said pulse generator to deliver pacing pulses at a rate which is a function of said at least one parameter, said control means further comprising limit means for limiting rate pacing adjustment between a low rate limit (LRL) and an upper rate limit (URL), and having LRL means for adjusting said LRL, said LRL means having

a temperature sensor for determining patient blood temperature,

measure means for determining from said patient blood temperature a measure of the daily low value of said blood temperature,

means for determining a threshold temperature at a predetermined relation to said measure of daily low value,

comparison means for continually comparing said blood temperature with said threshold, and up/down adjusting means for adjusting said LRL as a function of said comparison.

5,814,088

CARDIAC STIMULATOR WITH LEAD FAILURE DETECTOR AND WARNING SYSTEM

Patrick J. Paul, and David Prutchi, both of Lake Jackson, Tex., assignors to Sulzer Intermedics Inc., Angleton, Tex.

Filed Mar. 26, 1997, Ser. No. 824,454

Int. Cl.[6] A61N *1/37*

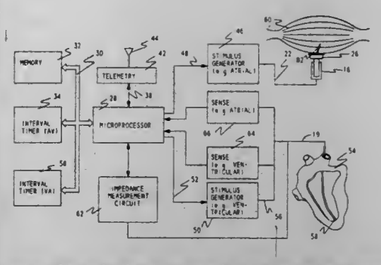
U.S. Cl. 607—28 **42 Claims**

1. A lead failure detector for use with a cardiac stimulator comprising:

means for measuring impedance of a lead;

means for calculating an upper impedance limit and a lower impedance limit;

means for comparing said measured impedance with the upper impedance limit and the lower impedance limit; and



means for activating an alarm in response to said measured impedance being one of greater than said upper impedance limit and less than said lower impedance limit.

5,814,089

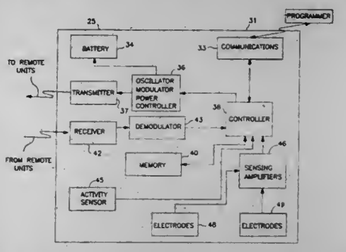
LEADLESS MULTISITE IMPLANTABLE STIMULUS AND DIAGNOSTIC SYSTEM

Kenneth B. Stokes, Anoka, and Adrianus P. Donders, Andover, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 18, 1996, Ser. No. 768,384

Int. Cl.[6] A61N *1/368*

U.S. Cl. 607—32 **31 Claims**



26. An implantable system having at least one implantable remote unit at a given body site and an implantable main device equipped with a battery power source, said at least one remote unit having receiving means for receiving power from high frequency signals and storage means for storing said received power, said main device having transmitter means for transmitting high frequency signals carrying at least a power component to said remote unit.

5,814,090

IMPLANTABLE MEDICAL DEVICE HAVING HEAT-SHRINK CONFORMING SHIELD

Scott T. Latterell, Minneapolis, and Dennis Brumwell, Bloomington, both of Minn., assignors to Angeion Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 486,759, Jun. 7, 1995. This application Nov. 18, 1996, Ser. No. 751,836

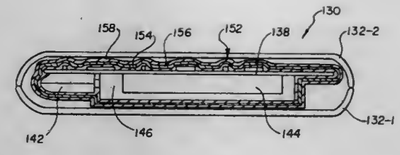
Int. Cl.[6] A61N *1/375*

U.S. Cl. 607—36 **12 Claims**

1. An implantable cardioverter defibrillator (ICD) device capable of subcutaneous positioning within a patient, the implantable cardioverter defibrillator comprising:

a housing comprising a biocompatible material at least a portion of which is conductive and used as an electrode for the ICD device;

circuitry positioned within the housing to control delivery of cardioversion/defibrillation countershocks, wherein the circuitry is susceptible to undesirable coupling effects;



an energy source coupled to the circuitry;

a capacitive energy storage system coupled to the energy source and the circuitry;

a first shape conforming isolation material encapsulating the circuitry inside the housing,

a thin layer of conductive shielding material surrounding the first shape conforming isolation material; and

a second shape conforming isolation material encapsulating the thin layer of shielding material.

5,814,091

ACTIVE MEDICAL IMPLANT HAVING A HERMETICALLY SEALED CAPSULE AND METHOD FOR MAKING SAME

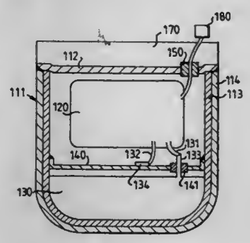
Kenneth Dahlberg, Stockholm, and Ulf Lindegren, Enskede, both of Sweden, assignors to Pacesetter AB, Solna, Sweden

Filed Mar. 24, 1997, Ser. No. 822,729

Claims priority, application Sweden, Mar. 26, 1996, 9601155

Int. Cl.[6] A61N *1/375*

U.S. Cl. 607—36 **24 Claims**



18. In an active medical implant having a battery and an electronics unit, the improvement comprising:

of a hermetically sealed capsule comprising a first part having a receptacle therein and comprising, at least in part, a multilayer material having a first layer consisting of a biocompatible material and a second layer consisting of a substantially diffusion-proof and substantially corrosion-resistant material, said first layer and said second layer being joined together with said layer of biocompatible material comprising an exterior wall of said first part;

a second part, closing an upper opening in said first part, and comprised of at least said biocompatible material;

a partition wall disposed in said receptacle in said first part, said partition wall comprising a substantially diffusion-proof, corrosion-resistant material and forming a first closed space in said first part in which said battery is disposed with said partition wall and a portion of said first part constituting a casing for said battery, said casing being an integral part of said first part;

said partition wall and said second part forming a second closed space in said first part in which said electronics unit is disposed;

said battery having first and second poles and said battery being in direct contact with said second layer of said first part, with said second layer comprising a first of the poles of said battery and being connected to said electronics unit; and

a feed-through extending through said partition wall for connecting a second of the poles of the battery to said electronics unit.

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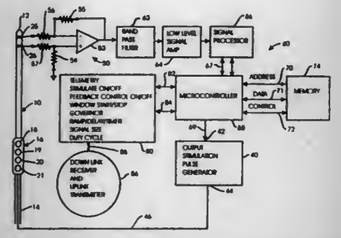
5,814,092
NEURAL STIMULATION TECHNIQUES WITH FEEDBACK

Gary William King, Fridley, Minn., assignor to Medtronic Inc., Minneapolis, Minn.

Continuation of Ser. No. 628,020, Apr. 4, 1996, Pat. No. 5,702,429. This application May 8, 1997, Ser. No. 853,306
Int. Cl.[6] A61N *1/08*
U.S. Cl. 607—46 8 Claims



1. A method of automatically adjusting action potentials in a nerve tissue of a living organism by electrical stimulation of said nerve tissue, said method comprising the steps of:

generating in response to a control signal a stimulation pulse having a pulse period and an amplitude;

applying said stimulation pulse at a first site on said nerve tissue to cause said action potentials in said nerve tissue, wherein at least one of said pulse period and said amplitude determines said action potentials generated in said nerve tissue;

receiving said action potentials transmitted by said nerve tissue at a recording locus of said nerve tissue, said recording locus being separated from said first site by a predetermined continuous portion of said nerve tissue;

generating a processing signal responsive to said action potentials received at said recording locus of said nerve tissue;

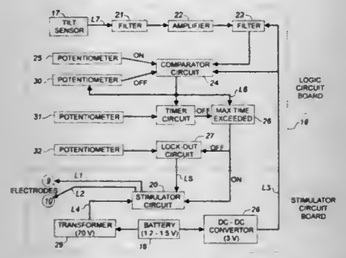
generating said control signal in response to said processing signal; and

reducing pain experienced by said living organism uniformly with time by adjusting at least one of said pulse period and said amplitude from said control signal to maintain said action potentials generated in said nerve tissue at substantially a predetermined action potential level.

5,814,093
ASSEMBLY FOR FUNCTIONAL ELECTRICAL STIMULATION DURING MOVEMENT

Richard B. Stein, Edmonton, Canada, assignor to Neuromotion Inc., Edmonton, Canada

Continuation-in-part of Ser. No. 530,603, Sep. 20, 1995. This application Sep. 19, 1996, Ser. No. 718,165
Int. Cl.[6] A61N *1/18*
U.S. Cl. 607—49 7 Claims



1. A functional electrical stimulator for use on a body limb, comprising:

a band, mountable on the limb, for carrying stimulator components;

cathode and anode electrodes carried by the band in a fixed condition;

means, carried by the band, for reproducibly positioning the band so that the electrodes are located at specified stimulation locations;

sensor means, carried by the band in a fixed condition, for measuring the angular position of the limb during movement and emitting sensor signals indicative thereof;

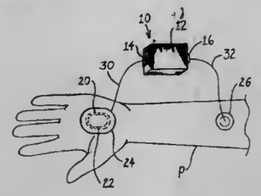
control circuit means, carried by the band and connected with the sensor means and electrodes, for receiving the sensor signals, processing the sensor signals to establish values indicative of the changing angularity of the limb as a function of time and to compare the established values with predetermined adjustable angular ON and OFF and time threshold values for initiating and terminating the emission of pulses through the electrodes when the established values reach the angular ON and OFF and time threshold values, to stimulate the limb; and

battery means carried by the band and connected with the sensor means and control circuit means, for supplying electrical power to them.

5,814,094
IONTOPHERETIC SYSTEM FOR STIMULATION OF TISSUE HEALING AND REGENERATION

Robert O. Becker, Box 278, Erie Canal Rd., Lowville, N.Y. 13367; A. Bartholomew Flick, 1 Lake Rabun Rd., P.O. Box 2088, Lakemont, Ga. 30552, and Adam J. Becker, 2 Chateaux Cir., Apt. 2L, Scarsdale, N.Y. 10583

Filed Mar. 28, 1996, Ser. Nn. 623,046
Int. Cl.[6] A61M *5/32*
U.S. Cl. 607—50 42 Claims



1. A method for treating a wound in a mammalian organism, said wound having a surface area, said method comprising the steps of:

placing a metal-containing anode in contact with said wound;

placing a cathode on intact skin near said anode; and

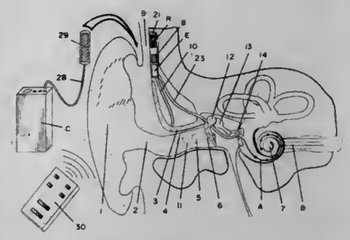
applying an approximately constant DC voltage of approximately 0.09–0.11 V/in^2 of said surface area across said anode and said cathode for a sufficient period of time to cause a sufficient number of metal ions from said anode to migrate into a region surrounding said wound so that at least a portion of said metal ions bind to collagen fibers in said region to form a metal-collagen complex.

5,814,095
IMPLANTABLE MICROPHONE AND IMPLANTABLE HEARING AIDS UTILIZING SAME

Gerd Müller, Unterschleissheim, and Hans Leysieffer, Taufkirchen, both of Germany, assignors to Implex GmbH Spezialhorgerate, Ismaning, Germany

Filed Mar. 13, 1997, Ser. No. 816,633
Claims priority, application Germany, Sep. 18, 1996, 196 38 158.4; Sep. 18, 1996, 196 38 159.2
Int. Cl.[6] H04R *25/00;* A61F *11/04;* A61B *1/375*
U.S. Cl. 607—57 30 Claims

23. Completely implantable hearing aid for electrical excitation of hearing comprising



a transcutaneously rechargeable implantable battery unit,

an external charging device for supplying electrical power transcutaneously to the battery unit,

a remotely controllable implantable electronic unit for audiological signal processing and for monitoring and controlling the implantable battery unit,

an external wireless remote control unit for controlling the implantable electronic unit,

an active electrode arrangement for electrical stimulation of hearing,

an implantable microphone having a microphone capsule which is accommodated in a hermetically sealed microphone housing, and

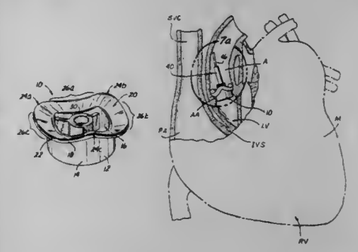
an electrical lead-in wire connector for routing at least one electrical connection from the interior of the microphone housing to the implantable electronic unit;

wherein the microphone housing has at least two legs which are aligned at an angle relative to one another, one leg holding the microphone capsule and being provided with a sound inlet membrane, and the other of said two legs containing the electrical lead-in wire connector and being set back relative to a plane in which the sound inlet membrane is disposed.

5,814,096
SIZING OBTURATOR FOR PROSTHETIC AORTIC VALVES

Hung Lam, Norco; Lisa Deseran, Manhattan Beach, and Richard Rhee, Diamond Bar, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 583,811, Jan. 5, 1996, abandoned. This application Oct. 24, 1997, Ser. No. 960,083
Int. Cl.[6] A61F *2/24*
U.S. Cl. 623—2 31 Claims



1. A reusable aortic valve sizing obturator apparatus comprising:

a cylindrical obturator body having a central axis, a top end, a bottom end, and an outer surface;

said cylindrical obturator body having a first outer diameter;

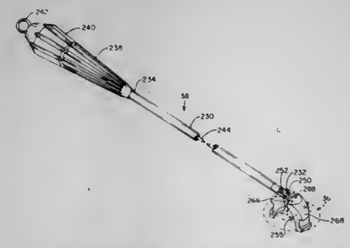
a rigid annular flange member extending generally radially outward from said cylindrical obturator body, said flange member having an upper surface, an undersurface, and a second outer diameter, said second outer diameter being larger than said first outer diameter said cylindrical obturator body and said flange member being formed of materials suitable for sterilization in an autoclave; and,

the undersurface of said flange member having, in a circumferential direction about said central axis, a non-planar, multicurvate configuration.

5,814,097
DEVICES AND METHODS FOR INTRACARDIAC PROCEDURES

Wesley D. Sterman, San Francisco; Michi E. Garrison, Belmont; Hanson S. Gifford, III, Woodside, and John H. Stevens, Palo Alto, all of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Continuation of Ser. No. 281,962, Jul. 28, 1994, which is a continuation-in-part of Ser. No. 163,291, Dec. 6, 1993, Pat. No. 5,571,215, which is a continuation-in-part of Ser. No. 23,778, Feb. 22, 1993, Pat. No. 5,452,733, said Ser. No. 281,962 is a continuation-in-part of Ser. No. 159,815, Nov. 30, 1993, Pat. No. 5,437,700. This application May 14, 1996, Ser. No. 645,692
Claims priority, application Australia, Dec. 3, 1992, PL6170
Int. Cl.[6] A61F *2/24*
U.S. Cl. 623—2 32 Claims



1. A prosthesis assembly for introduction into a patient's heart, the heart being within a chest defined by a plurality of ribs, each rib being separated from an adjacent rib by an intercostal space, the prosthesis assembly comprising:

a valve prosthesis having an attachment ring for attaching to cardiac tissue in the heart, the attachment ring defining a valve plane and an axial direction which is perpendicular to the valve plane, the valve prosthesis also having a movable valve portion; and

a holder releasably attached to the valve prosthesis and having a holder body with a holder height in the axial direction, the holder body including a handle coupling configured to receive an elongated handle for introducing the prosthesis assembly into the patient, the handle coupling having a coupling axis along which the tip of the handle is received, the handle coupling being positioned such that the coupling axis is at an angle substantially greater than zero relative to the axial direction;

wherein the holder and valve prosthesis together have a profile having a height in the axial direction of less than about 20 mm.

5,814,098
ADJUSTABLE SIZING APPARATUS

Thomas F. Hinnenkamp, White Bear Lake; Mark A. Blazei, Coon Rapids; Jonathan Kagan, Minneapolis; Brian M. Packard, Monticello; Ricci D. Smelser, Maple Lake; David M. Costello, Waconia; Angela L. Hillyard, Crystal, and Tim T. Hidani, Plymouth, all of Minn., assignors to St. Jude Medical, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 477,136, Jun. 7, 1995, abandoned. This application Jun. 3, 1996, Ser. No. 656,895
Int. Cl.[6] A61F *2/24;2/76*
U.S. Cl. 623—2 12 Claims

1. A system for sizing tissue annulus, the system comprising:

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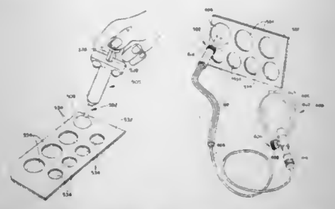


an elongated support member having a proximal end, a distal end and a passageway extending from the proximal end to the distal end;

an operator actuated movable member joined to the proximal end of the elongated support member for providing fluid through the passageway to the distal end;

an expandable member mounted to the distal end of the elongated support member and receiving the fluid, the expandable member having a reference axis and a substantially continuous outer curved surface disposed about the reference axis and selectively positionable in response to fluid provided by the operator actuated movable member between an inner position proximate the reference axis and an outer position spaced apart from the reference axis; and

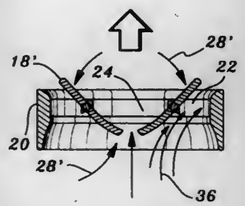
means for determining a dimension of the outer curved surface.

5,814,099

CENTRAL OPENING CURVED BILEAFLET HEART VALVE PROSTHESIS

Demetrio Bicer, 19161 Jasper Hill Rd., Trabuco, Canyon, Calif. 92679

Filed Aug. 12, 1996, Ser. No. 694,418
Int. Cl.[6] A61F *2/24*
U.S. Cl. 623—2 **28 Claims**



1. An improved bileaflet prosthetic heart valve comprising:

a cylindrical support ring having a central orifice for blood to flow through when said valve is open;

two leaflets for occluding the central orifice for preventing a reverse blood flow through the central orifice, each leaflet substantially semicircular in outline and pivotally suspended within the support ring by a pair of centrally disposed pivot means, wherein an imaginary line drawn between the pivot means of each leaflet substantially perpendicular to and substantially bisecting an axis of bilateral symmetry of each leaflet defines, on a first side of the line, an upstream leaflet portion whose semicircular edge approaches an inner wall of the support ring when the leaflets are in a closed position and, on a second side of the line, a downstream leaflet portion, edges of which downstream leaflet portion closely approach each other along a diameter of the central orifice when the leaflets are in the closed position, and with each leaflet curved in a cross-section taken perpendicular to said line between the pivot means so that a downstream end of each leaflet is disposed closer to said diameter of the central orifice than is said line between the pivot means when the leaflets are in an opened position;

a point of contact between each upstream leaflet portion and the support ring forming a sole point of contact therebetween when the leaflets are in the closed position, leaving clearance between the support ring and remaining upstream leaflet portions and preventing the downstream edges of the leaflets from touching each other;

complementary means disposed on the central orifice in juxtaposed relation with the pivot means of the leaflets for interacting with said pivot means to pivotally suspend the leaflets; and

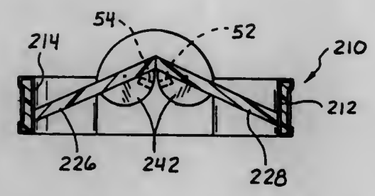
stop means for restricting pivoting of the leaflets wherein the leaflets cannot pivot beyond the opened position.

5,814,100

MECHANICAL PROSTHETIC VALVE, AND METHODS OF ITS CONSTRUCTION AND OPERATION

Alain Carpentier, Paris, France; George X. Guo, Dove Canyon, and Stefan G. Schreck, Vista, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Aug. 9, 1996, Ser. No. 694,580
Claims priority, application France, Feb. 20, 1996, 96 02052
Int. Cl.[6] A61F *2/24*
U.S. Cl. 623—2 **49 Claims**



1. A mechanical prosthetic valve for human implantation, said valve comprising:

a base portion defining a blood flow pathway therethrough;

a pair of valve leaflets pivotally disposed in said blood flow pathway and responsive to blood fluid pressure to pivot between a first position of occluding cooperation both with one another and with said base portion to inhibit blood flow in said pathway, and a second fully open pivotal position opening blood flow in said pathway; and

means for yieldably biasing said pair of valve leaflets both from said first position and from said second position toward a third pivotal position intermediate of said first and said second pivotal positions, wherein said third position for said pair of valve leaflets is angularly about half way between said first and second pivotal positions.

5,814,101

HOLDER FOR HEART VALVE PROSTHESIS

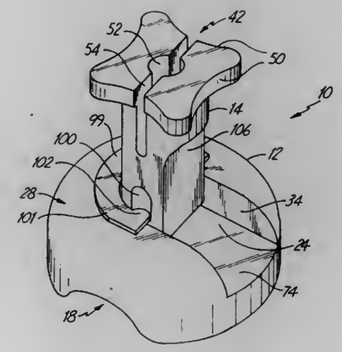
Margaret A. Wallner, Forest Lake; David R. Elizondo, St. Paul; Kimberly A. Anderson, Eagan; Guy P. Vanney, Blaine; Kurt D. Krueger, Stacy; Michael J. Girard, Lino Lakes; Stephen A. Petersen, Eagan; Darrin J. Bergman, and Terry L. Shepherd, both of Shoreview, all of Minn., assignors to St. Jude Medical, Inc., St. Paul, Minn.

Filed Sep. 25, 1996, Ser. No. 719,568
Int. Cl.[6] A61F *2/24;* **A61M** *5/00*
U.S. Cl. 623—2 **18 Claims**

1. A holder for a cardiovascular prosthetic device, comprising:

a single piece holder body adapted to contact generally opposed sides of a circumference of couple to the prosthetic device;

a stem extending in a longitudinal direction having a distal end and a proximal end used to manipulate the prosthetic device during implantation, the stem having a handle opening in the proximal end the handle opening extending in the longitudinal direction and adapted to releasably couple to an elongated handle upon application of a separation force directed in the longitudinal direction;



a pivotable attachment mechanism which pivotably couples the distal end of the stem to the holder body allowing the stem to pivot relative to the holder body about the attachment mechanism; and

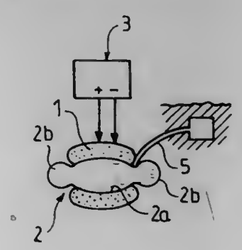
a locking mechanism adjacent the holder body and coupled to the holder body and to the distal end of the stem, the locking mechanism to selectively maintain the stem in at least one of a plurality of fixed angular positions relative to the holder body.

5,814,102

PROCESS FOR TRAINING A SKELETAL MUSCLE FOR A BIOMECHANICAL HEART AND BIOMECHANICAL HEART USING SUCH A MUSCLE

Norbert Guldner, Stettinerstrasse 12h, 23617-Stockeldorf, Germany, and Sylvain Thuaudet, Rue du Vieux Lavoir Cainet, 14480-le Fresne Camilly, France

PCT No. PCT/FR94/00571, § 371 Date Dec. 14, 1995, § 102(e) Date Dec. 14, 1995, PCT Pub. No. WO94/26326, PCT Pub. Date Nov. 24, 1994
PCT Filed May 13, 1994, Ser. No. 549,721
Claims priority, application France, May 14, 1993, 93 05853; Aug. 13, 1993, 93 09954; Oct. 11, 1993, 93 12075
Int. Cl.[6] A61M *1/10*
U.S. Cl. 623—3 **14 Claims**



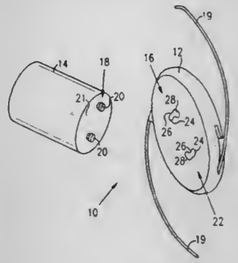
1. A process for dynamic training of a skeletal muscle (1) adapted to be used in a biomechanical heart, in which the skeletal muscle is wrapped about a deformable training apparatus (2) adapted to contract, opposing a contraction resistance, and then resumes its initial shape and the skeletal muscle (1) is stimulated by means of periodic electric pulses (3) so as to effect its contraction and that of the deformable training apparatus (2) and their subsequent relaxation, characterized in that during a first stage the skeletal muscle (1) is stimulated by means of electric pulses having a frequency increasing with time and during a second stage resistance of the deformable training apparatus (2) to contraction is progressively increased, the first and second stages if desired somewhat overlapping.

5,814,103

INTRAOCULAR LENS AND TELESCOPE WITH MATING FASTENERS

Isaac Lipsbitz, Herzliya Pituach; Yosef Gross, Moshav Mazor; Gideon Dotan, Yehud, and Eli Aharoni, Rishon le Zion, all of Israel, assignors to Visioncare Ltd., Yehud, Israel

Filed Jan. 15, 1998, Ser. No. 7,381
Int. Cl.[6] A61F *2/16*
U.S. Cl. 623—6 **17 Claims**



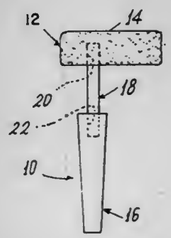
1. An intraocular lens implant comprising an intraocular lens, a telescope, and at least one mechanical fastener that fixedly attaches said telescope to said lens.

5,814,104

MIDDLE EAR OSSICULAR CHAIN PROSTHESIS, WITH A POROUS HYDROXYLAPATITE FLANGE

Franco Beoni, Via Venturini 6, 29100 Piacenza, Italy

Continuation-in-part of Ser. No. 202,800, Feb. 28, 1994, abandoned. This application Mar. 19, 1996, Ser. No. 616,512
Claims priority, application Italy, Nov. 26, 1993, M193A2504
Int. Cl.[6] A61F *2/18;2/28*
U.S. Cl. 623—10 **24 Claims**



1. An ossicular chain prosthesis for a middle ear, the prosthesis having a first end part for facing a tympanic membrane, at least a portion of the end part being for contacting the tympanic membrane and being comprised of ceramic hydroxylapatite, the ceramic hydroxylapatite being nonresorbable, porous and having a pore size of between 100 and 400 micrometers.

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5,814,105

USE OF AN ALFA-AMYLASE MODIFIED TO IMPROVE OXIDATION STABILITY IN A COMBINED DESIZING AND BLEACHING PROCESS

Annette Hanne Toft, Bagsværd; Dorthe Marcher, Farum; Hanne Høst Pedersen, Lyngby, and Thomas Erik Nilsson, Copenhagen Ø, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK94/00371, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/21247, PCT Pub. Date Aug. 10, 1995

PCT Filed Oct. 5, 1994, Ser. No. 687,399

Claims priority, application Denmark, Feb. 2, 1994, 141/94

Int. Cl.[6] **C12N** *9/28;15/56;* **D06L** *1/14;* **C11D** *3/386*

U.S. Cl. 8—111 **16 Claims**

1. A process for simultaneously desizing and bleaching a sized fabric containing starch or starch derivatives, said process comprising treating the fabric with a bleaching composition and an oxidation stable α-amylase, wherein the α-amylase comprises the amino acid sequence of SEQ ID NO:2 or an analogue of said α-amylase, which

i) is at least 60% homologous with the sequence shown in SEQ ID NO:2,

ii) reacts with an antibody raised against said α-amylase, and

iii) is encoded by a DNA sequence which hybridizes with the same probe as a DNA sequence encoding the α-amylase having the amino acid sequence of SEQ ID NO:2.

5,814,106

COMPOSITION FOR THE OXIDATION DYEING OF KERATIN FIBRES CONTAINS A 4-HYDROXYINDOLINE COUPLER AT AN ACIDIC PH AND DYEING PRGCESS USING THIS COMPOSITION

Marie-Pascale Audousset, Asnieres, France, assignor to L'Oreal, Paris, France

PCT No. PCT/FR96/01472, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO97/11673, PCT Pub. Date Mar. 3, 1997

PCT Filed Sep. 20, 1996, Ser. No. 836,897

Claims priority, application France, Sep. 25, 1995, 95 11223

Int. Cl.[6] **A61K** *7/13*

U.S. Cl. 8—409 **28 Claims**

1. A ready-to-use composition for the oxidation dyeing of keratin fibres, said composition comprising, in a medium which is suitable for dyeing, at least one oxidation base; 4-hydroxyindoline and/or at least one acid addition salt thereof as a coupler; and at least one oxidizing agent, wherein the pH of said composition is below 7.

5,814,107

PHOTOCHEMICALLY STABILIZED POLYAMIDE COMPOSITIONS

Dean R. Gadoury, Asheville, and Bobby J. Bailey, Candler, both of N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 690,692, Jul. 31, 1996. This application Feb. 21, 1997, Ser. No. 804,312

Int. Cl.[6] **D06P** *3/06*

U.S. Cl. 8—442 **9 Claims**

1. A process for preparing photochemically stable dyed nylon compositions comprising:

providing to a dyebath a shaped article of poly(epsilon-caprolactam) hydrolytically polymerized in the presence of water, and a hindered piperidine derivative selected from the group consisting of:

4-amino-2,2',6,6'-tetramethylpiperidine;

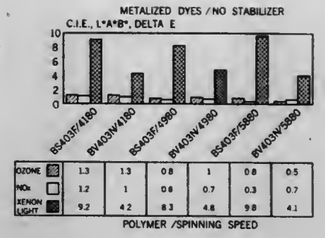
4-(aminoalkyl)-2,2',6,6'-tetramethylpiperidine;

4-(aminoaryl)-2,2',6,6'-tetramethylpiperidine;

3-amino-2,2',6,6'-tetramethylpiperidine;

3-(aminoalkyl)-2,2',6,6'-tetramethylpiperidine;

3-(aminoaryl)-2,2'6,6'-tetramethylpiperidine;



2,2',6,6'-tetramethyl-4-piperidinecarboxylic acid:

2,2',6,6'-tetramethyl-4-piperidinealkylcarboxylic acid;

2,2',6,6'-tetramethyl-4-piperidinearylcarboxylic acid;

2,2',6,6'-tetramethyl-3-piperidinecarboxylic acid;

2,2',6,6'-tetramethyl-3-piperidinealkylcarboxylic acid; and

2,2',6,6'-tetramethyl-3-piperidinearylcarboxylic acid; and

in the dyebath, dyeing the shaped article with one or more metalized or nonmetalized acid dyestuffs.

5,814,108

METHOD FOR MANUFACTURING NICKEL-METAL-HYDRIDE BATTERY

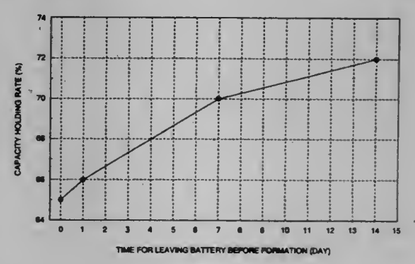
Katsuya Nanamoto, and Yuichi Umehara, both of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

Filed Aug. 8, 1995, Ser. No. 512,414

Claims priority, application Japan, Aug. 9, 1994, 6-209093; Aug. 11, 1994, 6-212039

Int. Cl.[6] **H01M** *10/30*

U.S. Cl. 29—623.1 **20 Claims**



1. A method for manufacturing a nickel-metal-hydride battery comprising the steps of: assembling and sealing a nickel-metal-hydride battery comprising a positive electrode including a nickel hydroxide, a negative electrode including a hydrogen occlusion alloy, a separator, an alkali electrolyte, and a battery vessel;

a formation step comprising at least one charging/discharging of said nickel-metal-hydride battery;

after said formation step, charging said nickel-metal-hydride battery;

after said charging step, leaving said nickel-metal-hydride battery in a charged state for from one day until a time when the battery can no longer self-discharge;

after said leaving step, charging said nickel-metal-hydride battery; and

after said charging step after said leaving step, at least one charge/leaving/discharging step;

further comprising the step of, before said formation step, leaving said nickel-metal-hydride battery for in a range of seven days to twenty days.

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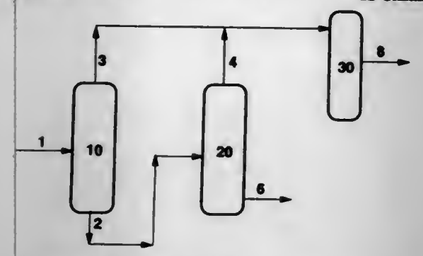
5,814,109

DIESEL ADDITIVE FOR IMPROVING CETANE, LUBRICITY, AND STABILITY

Bruce R. Cook, Pittstown; Paul J. Berlowitz, East Windsor, both of N.J., and Robert J. Wittenbrink, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Feb. 7, 1997, Ser. No. 798,384
Int. Cl.[6] C10L *1/18;* **C07C** *5/27*
U.S. Cl. 44—300 **12 Claims**



1. A diesel fuel additive comprising

(i) ≧90 wt % C_{16}–C_{20} paraffins, of which ≧50% are isoparaffins at least a portion of which are mono-methyl branched;

(ii) cetane number of ≧87;

(iii) ≧2500 ppm as oxygen of C_{14}–C_{16} linear, primary alcohols;

(iv) a boiling range of 540°–680° F.

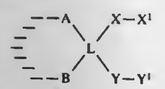
5,814,110

CHEMICAL COMPOSITIONS AND USE AS FUEL ADDITIVES

Kenneth William Bartz, Baytown, Tex.; Jacqueline Dawn Bland, Wantage, United Kingdom; David Paul Gillingham, Swindon, United Kingdom; Richard Dix Kerwood, Didcot, United Kingdom; Edwin William Lehmann, Faringdon, United Kingdom; Kenneth Lewtas, Wantage, United Kingdom; John Edward Maddox, Swindon, United Kingdom; Albert Rossi, Warren, N.J., and Robert Dryden Tack, Abingdon, United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 931,651, Aug. 17, 1992, abandoned, which is a continuation of Ser. No. 804,879, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 324,598, Mar. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,109, Oct. 26, 1988, abandoned, which is a continuation of Ser. No. 99,083, Sep. 21, 1987, abandoned, Ser. No. 248,364, Sep. 23, 1988, abandoned, and Ser. No. 248,664, Sep. 23, 1988, abandoned, which is a continuation of Ser. No. 99,085, Sep. 21, 1987, abandoned, said Ser. No. 248,364 is a continuation of Ser. No. 99,084, Sep. 21, 1987, abandoned.
This application Nov. 23, 1994, Ser. No. 344,789
Claims priority, application United Kingdom, Sep. 24, 1986, 86-22959; Sep. 24, 1986, 86-22960; Sep. 24, 1986, 86-22961; Aug. 17, 1987, 87-19423
Int. Cl.[6] C10L *1/24;1/22;1/18*
U.S. Cl. 44—370 **13 Claims**

5. Distillate fuel boiling in the range 120° C. to 500° C. containing 0.0001 to 0.5 wt. % of a compound of the general formula



where

A and B may be the same or different and may be alkyl, alkenyl or aryl;

L is selected from the group consisting of
>CH–CH<
and >C=C<

and A, B and L together can constitute part of a cyclic structure which can be aromatic, alicyclic or mixed aromatic/alicyclic, and with the proviso that the groups —X–X^1 and Y–Y^1 are located on different carbon atoms constituting L and in that when A, B and L do not constitute part of a cyclic structure one of A or B may be hydrogen and in that when L is non-cyclic ethylenic, said X–X^1 and Y–Y^1 groupings are present in a cis configuration;

X is selected from the group consisting of
$—SO_3^{(-)}$, $—S(O_2)O—$, $—S(O_2)—$, —C(O)—, $—CO_2^{(-)}$, $—R^4C(O)O—$, $—N(R^3)C(O)—$, $—R^4O—$, $R^4OC(O)—$, $—R^4—$ and $—N(COR^3)—$;
when X is $—SO_3^{(-)}$ OR $—CO_2^{(-)}$

X^1 is selected from the group consisting of
$N^{(+)}R_3{}^3R^1$, $N^{(+)}HR_2{}^3R^1$, $N^{(+)}H_2\ R^3R^1$ and $N^{(+)}H_3R^1$;
when X is $—S(O_2)—$ or —C(O)—
X^1 is $—NR^3R^1$;
when X is $—S(O_2)O—$, $—R^4C(O)O—$, $—N(R^3)C(O)—$, $—R^4O—$, $—R^4OC(O)—$, $—R^4—$ and $—N(COR^3)—$
X^1 is $—R^1$;

Y is selected from $—SO_3^{(-)}$, $—S(O_2)—$ or $—S(O_2)O—$;
when Y is $—SO_3^{(-)}$

Y^1 is selected from the group consisting of
$N^{(+)}R_3{}^3R^2$, $N^{(+)}HR_2{}^3R^2$, $N^{(+)}H_2R^3R^2$ and $N^{(+)}H_3R^2$;
when Y is $—S(O_2)—$
Y^1 is $—NR^3R^2$;
when Y is $—S(O_2)O—$
Y^1 is $—R^2$;

and wherein R^1 and R^2 are straight chain or branched at the 1 or 2 position, and are independently selected from the group consisting of alkyl, alkoxy alkyl or polyalkoxyalkyl groups containing at least 10 carbon atoms in their main chain;

R^3 is hydrocarbyl and each R^3 is the same or different; and

R^4 is $—(CH_2)_n$ where n is from 0 to 5.

5,814,111

GASOLINE COMPOSITIONS

Joseph Graham, Katy, Tex., and Cornelis Van Es, Adisham, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 403,536, Mar. 14, 1995, abandoned.
This application Aug. 6, 1996, Ser. No. 693,693
Int. Cl.[6] C10L *1/18;1/22*
U.S. Cl. 44—443 **11 Claims**

1. A gasoline composition comprising a major amount of gasoline suitable for use in spark-ignition engines, a minor amount of polyalphaolefin having a viscosity at 100° C. from about 2×10^{-6} m^2/s to about 2×10^{-5} m^2/s (2 to 20 centistokes), being a hydrogenated oligomer containing from 18 carbon atoms to 80 carbon atoms derived from at least one alphaolefinic monomer containing from 8 carbon atoms to 16 carbon atoms, a minor amount of a polyoxyalkylene compound having the formula I:

$$R^1—O(R—O)_nR^2$$

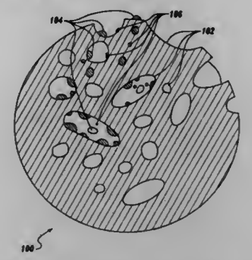
wherein R^1 and R^2 independently represent hydrogen atoms or C_{1-40} hydrocarbyl groups, each R independently represents a C_{2-8} alkylene group and n is such that the Mn of the polyoxyalkylene compound is from about 700 to about 2000, and a minor amount of a hydrocarbon-soluble ashless dispersant comprising a polyolefin-substituted succinimide derivative wherein the polyolefin has a Mn from about 800 to about 5000, the weight ratio of polyalphaolefin:polyoxyalkylene compound being from about 1:5 to about 5:1.

5,814,112

NICKEL/RUTHENIUM CATALYST AND METHOD FOR AQUEOUS PHASE REACTIONS

Douglas C. Elliott, Richland, and John L. Sealock, West Richland, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 227,892, Apr. 15, 1994, Pat. No. 5,616,154, which is a continuation of Ser. No. 893,701, Jun. 5, 1992, abandoned. This application Dec. 19, 1996, Ser. No. 775,337
Int. Cl.[6] C10J *3/00*
U.S. Cl. 48—197 R **26 Claims**



1. A method for hydrogenation of an organic material in an aqueous phase into a product, comprising the steps of:

providing a liquid reactant mixture containing liquid water and said organic material within a pressure reactor;

adding a catalyst in the form of a plurality of particles, each particle formed of a porous support with an amount of a reduced nickel metal catalyst phase deposited upon the porous support in a first dispersed phase providing a catalyst activity, further having an added ruthenium metal upon the porous support as a second dispersed phase in an amount that is effective in resisting agglomeration or sintering of the nickel metal catalyst phase, wherein said second dispersed phase is separate and distinct from said first dispersed phase, and

maintaining said liquid reactant mixture at temperature and pressure conditions from about 150° C. to about 350° C. and a hydrogen overpressure.

5,814,113

ABRASIVE SUSPENSION SYSTEMS AND METHODS OF MAKING THE SAME

Edward J. Neuland, Houston, Tex., assignor to Diamond Scientific, Inc., Houston, Tex.

Continuation of Ser. No. 717,409, Sep. 20, 1996, which is a division of Ser. No. 488,513, Jun. 9, 1995, Pat. No. 5,603,739. This application Apr. 8, 1997, Ser. No. 838,505
Int. Cl.[6] B24D *3/34*
U.S. Cl. 51—298 **17 Claims**

1. An abrasive composition comprising:

from about 5% to about 96% by weight water;

from about 3% to about 94% by weight of a polyhydric alcohol ether compound;

from about 0.00075% to about 0.25% by weight of surfactant;

from about 0.0015% to about 1% by weight polymer; and

from about 0.001% to about 50% by weight abrasives.

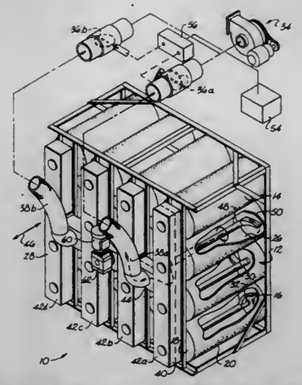
5,814,114

AIRBORNE WASTE FILTER ARRANGEMENT

Helmut Stueble, Spartanburg, S.C., assignor to LTG Air Engineering, Inc., Spartanburg, S.C.

Filed Mar. 24, 1997, Ser. No. 823,807
Int. Cl.[6] B01D *29/62*
U.S. Cl. 55—284 **22 Claims**

1. An airborne waste system, said system comprising:



an array of drum filters, each drum filter of said array of drum filters having a forward end into which air carrying waste material flows, a rearward end longitudinally opposite said forward end, and a filter section extending between said forward end and said rearward end, said forward end, said rearward end and said filter section defining an interior area of said drum filter;

a frame disposed in a permanent operative position proximate said array of drum filters;

a plurality of longitudinal members, each said longitudinal member operatively disposed on said frame and extending into a said interior area of a said drum filter and having a suction nozzle extending therefrom to operatively communicate with the interior surface of said filter section for removing said waste material therefrom;

a drive mechanism in operative communication with said longitudinal members to rotate each said longitudinal member about its longitudinal axis and to reciprocally move each said longitudinal member substantially along the longitudinal axis of said drum filter into which said longitudinal member extends so that a suction end of said suction nozzle is moved substantially over said inner surface of said filter section; and

a suction source in operative communication with each said suction nozzle, said suction source configured to apply suction to said suction nozzle so that said waste material is drawn therethrough.

5,814,115

GREASE FILTER FOR EXHAUST SYSTEMS IN COMMERCIAL FOOD PREPARATION ENVIRONMENTS

Darryl Allen, 8712 W. Central, Sylvania, Ohio 43560, and David Westfall, 5854 N. Yermo, #Q-1, Toledo, Ohio 43613

Filed Dec. 27, 1996, Ser. No. 774,944
Int. Cl.[6] B01D *35/02*
U.S. Cl. 55—350.1 **19 Claims**

1. A grease filter system for use in connection with retaining viscous products of combustion in commercial food preparation environments, said filter system comprising:

a receptacle and a filter element removably supported within said receptacle;

said receptacle having a top covering one end thereof and a bottom, said top including an opening through which grease, condensed steam, water and other products of combustion enter said system, said top further including a grease dispersion tray including a portion which is inclined relative to the general plane of said top, said grease dispersion tray having a plurality of holes disposed along said inclined portion in the path of grease such that the grease moves over the dispersion tray and is spread over said filter element, said receptacle further including a plurality of apertures disposed spaced from said bottom about the perimeter of said receptacle such that

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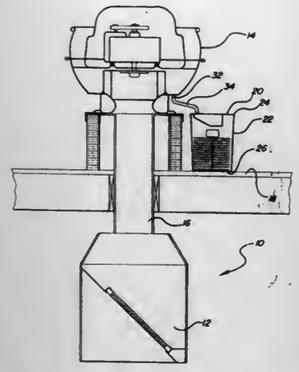
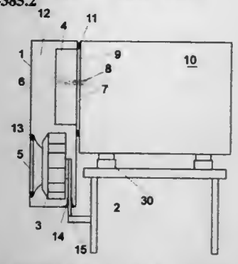


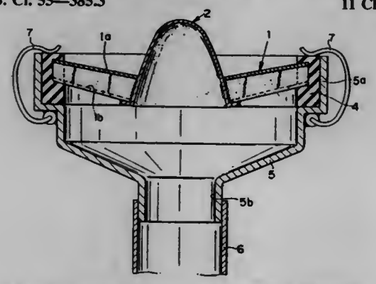
said filter system retains grease and other viscous fluids in said filter element while allowing condensed steam, water and other products of combustion to pass through said filter element and out said receptacle through said apertures.

5,814,116
ARRANGEMENT FOR GENERATING A PURIFIED, LOW-TURBULENCE AIR FLOW FOR SUPPLYING LOCAL CLEAN ROOMS
Heinz Schneider, and Klaus Schultz, both of Jena, Germany, assignors to Jenoptik Aktiengesellschaft, Jena, Germany
Filed Jun. 13, 1996, Ser. No. 663,486
Claims priority, application Germany, Oct. 13, 1995, 195 38 040.1
Int. Cl.[6] B01D *46/00*
U.S. Cl. 55—385.2 **6 Claims**



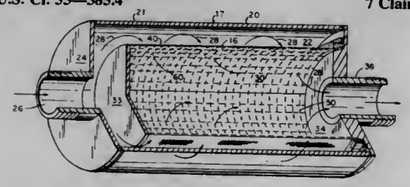
1. An arrangement for generating a purified, low-turbulence air flow for supplying a local clean room, comprising:
a chamber defining a room provided for generating a plenum and which is housed by walls, said walls including a pair of parallel first and second walls, said chamber having an inlet opening in the first wall serving as an inlet of ambient unpurified air into the room and an outlet opening in the second wall serving as an outlet of air from the room to the local clean room;
a fan disposed in the chamber and being connected to said inlet opening in the first wall for drawing in ambient unpurified air therethrough;
a filter disposed in the chamber and having a first filter side provided for the outlet of the purified air flow and contacting the outlet opening in said second wall, said filter having a second filter side disposed adjacent to said first wall located opposite to the outlet opening, a space between said first wall and said second filter side serving as a retaining space and being in communication with the rest of the room; and
holding and fastening elements for fastening said fan to a base frame located outside the plenum chamber, said holding and fastening elements including means for vibrationally isolating said fan from said filter by emerging from the plenum chamber without being supported by the walls of the plenum chamber.

5,814,117
FILTER ELEMENT FOR AIR CLEANER FOR ENGINE
Kazuomi Mochida, Tokyo, Japan, assignor to Going Tokyo Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1996, Ser. No. 595,409
Claims priority, application Japan, Oct. 30, 1995, 7-012425
Int. Cl.[6] B01D *46/52*
U.S. Cl. 55—385.3 **11 Claims**



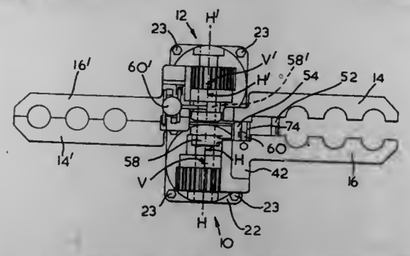
1. A vehicle engine air cleaner filter element comprising:
a main body member formed from a quadrangular filter material member folded laterally into pleats having a first edge at one end and a second edge at the other end, said first and second edges being connected to each other in a side-by-side relationship forming a main body member having a substantially annular contour with said pleats extending radially, said main body member having an inner edge forming a central opening and an outer edge; and
a cover member having a circular contour attached to said main body member and covering said central opening;
said filter element having the structural capability to withstand the differential pressure across said element caused by air flowing through an air cleaner during operation of a vehicle engine connected thereto.

5,814,118
HEPA FILTER FOR VENTING CHAMBERS
Terry J. Wickland, Golden, and Craig Washburn, Littleton, both of Colo., assignors to Nuclear Filter Technology, Inc., Golden, Colo.
Filed Nov. 18, 1996, Ser. No. 751,752
Int. Cl.[6] B01D *46/24*
U.S. Cl. 55—385.4 **7 Claims**



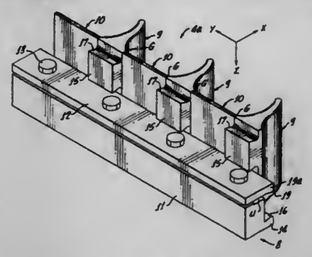
1. A vent assembly comprising:
an annular housing having first and second ends, and having a wall defining a space for receiving gas flowing through the first end, the first end having a gas inlet therein;
a filter element disposed in the space within the annular housing, the filter element having an annular wire mesh support tube having first and second ends and defining a hollow core, the filter element being radially from the wall of the annular housing to provide an annular plenum between the filter element and housing, and the filter element also being axially spaced from and free of the first end of the annular housing, wherein gas entering through the inlet in the housing flows into the annular plenum;
a first end plate completely closing the first end of the wire mesh support tube and a second end plate over the second end of the wire mesh support tube, the second plate having an exhaust outlet therethrough communicating with the hollow core;
a filter media of metallic fibers disposed around the wire mesh support tube, the filter media having longitudinal edges welded to one another and circular end edges welded to the end plates, whereby gas flowing into the vent assembly fills the plenum around the filter element and passes through the filter media and into the hollow core of the filter element before exhausting through the exhaust outlet communicating with the hollow core.

5,814,119
TRANSFER MECHANISM
Stanley Peter Jones, Tickhill, United Kingdom, and Zdenko Kuz, Cham, Switzerland, assignors to Emhart Glass Machinery Investments Inc., Wilmington, Del.
Filed Feb. 4, 1997, Ser. No. 795,173
Claims priority, application United Kingdom, Feb. 15, 1996, 9603183
Int. Cl.[6] C03B *9/44*
U.S. Cl. 65—235 **4 Claims**



1. An I.S. machine having at least one section having a blank station where gobs of molten glass are formed into parisons and a blow station where the parisons are formed into bottles, with the direction from the blank mold to the blow mold being the transfer direction, each comprising
a section frame,
a transfer mechanism for transferring parisons from the blank station to the blow station, said transfer mechanism including
a first pair of opposed closed neck ring arms,
a second pair of opposed closed neck ring arms,
a first support for supporting said first pair of opposed closed neck ring arms for rotation 180° about a first horizontal axis extending perpendicularly to the transfer direction, from a start position at the blank station where said neck ring arms extend horizontally, through an intermediate position where said neck ring arms extend vertically upwardly, to an end position at the blow station where said arms extend horizontally,
a second support for supporting said second pair of opposed closed neck ring arms for rotation 180° about a second horizontal axis extending perpendicularly to the transfer direction, from a start position at the blank station where said arms extend horizontally, through an intermediate position where said neck ring arms extend vertically upwardly, to an end position at the blow station where said arms extend horizontally,
a third support for supporting said first support for rotation about a first vertical axis from a first orientation where said first horizontal axis extends perpendicularly to the transfer direction to a second orientation, and
a fourth support for supporting said second support for rotation about a second vertical axis from a first orientation where said second horizontal axis extends perpendicularly to the transfer direction to a second orientation,
said first support and said first pair of opposed closed neck ring arms being selectively configured so that when said first support is at said second orientation and said first pair of closed neck ring arms is at said intermediate position and said second support is at said first orientation, said second pair of neck ring arms can be rotated about said first horizontal axis from the blank station to said blow station, and
said second support and said second pair of opposed closed neck ring arms being selectively configured so that when said second support is at said second orientation and said second pair of closed neck ring arms is at said intermediate position and said first support is at said first orientation, said first pair of neck ring arms can be rotated about said first horizontal axis from the blank station to said blow station.

5,814,120
SWEEPOUT ASSEMBLY WITH NONMETALLIC PADS
Patrick H. Lloyd, Decatur, and Kyle D. Nelson, Sanger, both of Tex., assignors to Union Oil Company of California, El Segundo, Calif.
Filed Nov. 27, 1995, Ser. No. 562,738
Int. Cl.[6] C03B *9/04;9/44;11/00;13/00*
U.S. Cl. 65—260 **35 Claims**



1. A pad for contacting hot-glass articles comprising:
(a) a support connection surface capable of being attached to a support member; and
(b) a nonmetallic glass-contact arm connected to and extending outwardly from said support surface, said arm having a front concave contact surface and a back convex contact surface.

5,814,121
OXYGEN-GAS FUEL BURNER AND GLASS FOREHEARTH CONTAINING THE OXYGEN-GAS FUEL BURNER
Ian D. Travis, Waterville, Ohio, assignor to The BOC Group, Inc., New Providence, N.J.
Filed Feb. 8, 1996, Ser. No. 598,460
Int. Cl.[6] C03B *3/00;5/00;5/16;9/38*
U.S. Cl. 65—346 **21 Claims**

1. An oxygen-gas fuel burner having an inner and outer nozzle for use in a refractory burner block of glass distribution and conditioning channels for thermally treating glass, the oxygen-gas fuel burner comprising:
a burner housing, said burner housing having a gas fuel conduit extending to a central fuel outlet of an inner fuel nozzle, an outer nozzle of a conical shape having an outer and inner surface; said inner nozzle having an outer surface and a

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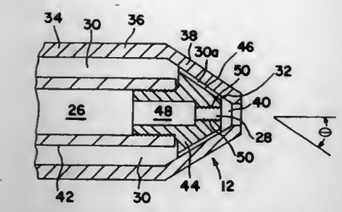
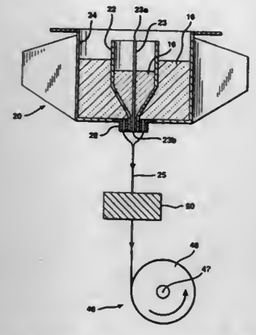


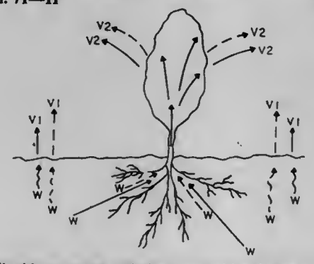
central fuel outlet in communication with said gas fuel conduit, said inner nozzle having a forward conforming to said inner surface of said outer nozzle, said inner nozzle having a plurality of grooves circumferentially spaced in said forward face, said grooves and said inner surface define a plurality of passages having an upstream end communicating with an annular oxygen conduit defined by the inner wall of the outer nozzle and an outer wall of an inner tubular member of said fuel conduit; said outlet of said inner nozzle and downstream end of said passages communicate with a burner tip chamber defined by a portion of said outer nozzle and the surface of said inner nozzle in communication with said outer nozzle outlet.

5,814,122
METHOD OF MAKING HOLLOW HIGH TEMPERATURE CERAMIC SUPERCONDUCTING FIBERS
Jianzhong Huang, Westerville, Ohio, assignor to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.
Filed Dec. 12, 1995, Ser. No. 571,061
Int. Cl.[6] C03B *37/022*
U.S. Cl. 65—393 **12 Claims**



1. A process of making a hollow superconducting fiber comprising the steps of:
providing a bushing including a first source of molten superconducting composition precursor, a second source of molten glass composition, and a gas conduit, wherein said gas conduit is positioned within said first source of molten material;
forming a hollow preform having a core portion formed of the superconducting composition precursor and an outer layer portion formed of the glass composition by drawing said molten superconducting composition precursor from said first source such that said molten superconducting composition precursor comprises a hollow core portion, by drawing said glass composition from said second source of molten material, and by cooling said molten compositions to form said hollow preform; and
heat treating the hollow preform to form a hollow superconducting fiber having a superconducting core surrounded by a glass cladding layer.

5,814,123
METHOD FOR IMPROVING SURVIVAL OF PLANTS IN CONDITIONS OF REDUCED WATERING
Ronald P. Hansen, New South Wales, Australia, assignor to Ecologel USA, Inc., Ocala, Fla.
Continuation of Ser. No. 739,455, Aug. 2, 1991, abandoned. This application Nov. 2, 1992, Ser. No. 970,546
Int. Cl.[6] C05F *11/00*
U.S. Cl. 71—11 **18 Claims**



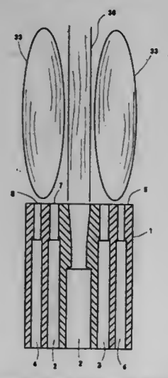
1. A liquid concentrate solution composition for improving plant root watering consisting essentially of an organic humectant, a thickener, a binder and water, in which the parts by volume based on the total composition are (1) humectant from 25 to 75, (2) thickener from 0.2 to 1.5, (3) binder from 0.2 to 5, and (4) water 75 to 25.

8. The composition of claim 1 in which the parts by volume based on the total composition are (1) humectant 30 to 60, (2) thickener 0.2 to 0.5, (3) binder 0.2 to 5.0, (4) wetting agent 0.2 to 2.0, and (5) water 60 to 30.

5,814,124

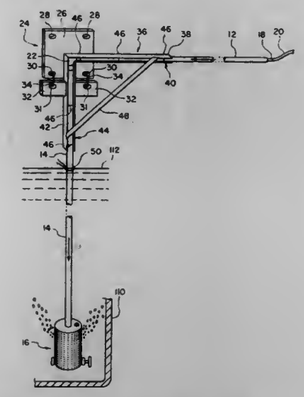
Patent Not Issued For This Number

5,814,125
METHOD FOR INTRODUCING GAS INTO A LIQUID
John Erling Anderson, Somers; Pravin Chandra Mathur, Bronx, and Ronald Joseph Selines, North Salem, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.
Filed Mar. 18, 1997, Ser. No. 819,810
Int. Cl.[6] C22B *9/05*
U.S. Cl. 75—414 **17 Claims**



1. A method for introducing gas into a liquid pool comprising:
(A) ejecting gas from a lance having a converging/ diverging nozzle with an exit diameter (d) and having a tip spaced from the surface of the liquid pool, and forming a gas stream having a supersonic initial jet axis velocity upon ejection from the lance tip;
(B) surrounding the gas stream with a flame envelope having a velocity less than that of the gas stream, passing the gas stream from the lance tip to the liquid pool surface through a distance of at least 20d, and contacting the liquid pool surface with the gas stream having a supersonic jet axis velocity; and
(C) passing gas from the gas stream through the surface of the liquid pool and into the liquid pool.

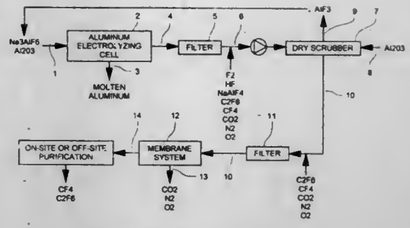
5,814,126
METHOD AND APPARATUS FOR PRODUCING BRIGHT AND SMOOTH GALVANIZED COATINGS
Thomas H. Cook, 430 E. Dakota St., Spearfish, S. Dak. 57783
Continuation of Ser. No. 493,498, Jun. 22, 1995, abandoned, which is a continuation-in-part of Ser. No. 180,414, Jan. 12, 1994, abandoned. This application Oct. 14, 1997, Ser. No. 949,331
Int. Cl.[6] C22B *19/00*
U.S. Cl. 75—663 **17 Claims**



1. A method of cleaning and removing scale from a sidewall of a galvanizing kettle containing molten zinc, said method comprising:
immersing a gas injector into said molten zinc;
injecting nitrogen into said molten zinc through said injector below the surface of said zinc and bubbling nitrogen through said molten zinc adjacent a sidewall of said kettle, wherein at least a portion of said nitrogen contacts the wall of said kettle, thereby removing scale from said sidewall and reducing the formation of ash.

5,814,127
PROCESS FOR RECOVERING CF_4 AND C_2F_6 FROM A GAS
Yao-En Li, Buffalo Grove, Ill., assignor to American Air Liquide Inc., Walnut Creek, Calif.
Filed Dec. 23, 1996, Ser. No. 772,469
Int. Cl.[6] B01D *46/00;53/14;53/22*
U.S. Cl. 95—47 **12 Claims**

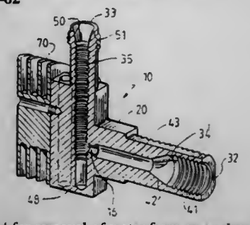
1. A process for recovering at least one of CF_4 and C_2F_6 from a vent gas from an aluminum electrolysis cell, said process comprising the steps of:
(a) removing inorganic fluorides from a vent gas comprising inorganic fluorides and at least one of CF_4 and C_2F_6 to obtain a purified vent gas; and



PROCESS FLOW DIAGRAM FOR C2F6 AND CF4 RECYCLE

(b) contacting said purified vent gas with a membrane at conditions effective to obtain a retentate stream rich in at least one of CF_4 and C_2F_6, and a permeate stream depleted in at least one of CF_4 and C_2F_6.

5,814,128
WATER MANAGEMENT DEVICE FOR GAS CHROMATOGRAPHY SAMPLE CONCENTRATION
Kenneth K. Jiang, and Bernie B. Bernard, both of College Station, Tex., assignors to OI Corporation, College Station, Tex.
Continuation of Ser. No. 562,840, Nov. 27, 1995, Pat. No. 5,582,633, which is a continuation of Ser. No. 282,171, Jul. 29, 1994, Pat. No. 5,470,380, which is a division of Ser. No. 61,986, May 14, 1993, Pat. No. 5,358,557, which is a division of Ser. No. 848,395, Mar. 9, 1992, Pat. No. 5,250,093. This application Dec. 9, 1996, Ser. No. 762,666
Int. Cl.[6] B01D *15/08*
U.S. Cl. 95—82 **13 Claims**



2. A method for removal of water from an analyte stream that is purged from a sparge vessel to a trap and desorbed from the trap to a gas chromatograph, comprising:
purging analytes from the sparge vessel and passing the purged analytes through a flow path connecting the sparge vessel to the trap, the flow path being at a purge temperature higher than the sparge vessel;
desorbing the analytes from the trap;
passing the desorbed analytes along the flow path from the trap to the gas chromatograph;
maintaining the flow path at a desorb temperature lower than the purge temperature but not lower than ambient room temperature;
heating the flow path to a bake temperature sufficient to expel water vapor from the flow path through a vent.

5,814,129
RADIAL FLOW ADSORPTION VESSEL
Stephen Clyde Tentarelli, Fogelsville, Pa., assignor to Air Products and Chemical, Inc., Allentown, Pa.
Filed Apr. 11, 1997, Ser. No. 840,090
Int. Cl.[6] B01D *53/04*
U.S. Cl. 95—90 **10 Claims**

1. A method for imparting a generally U-shaped flow pattern to fluids flowing inside a vessel of the type having an elongated

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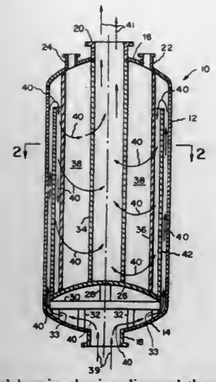


closed cylindrical housing having disposed there in at least one annular shaped bed of an adsorbent material said housing having means on one end for admitting fluid to said bed, and means on an opposite end of said vessel for removing fluid from, said bed, comprising:

installing means inside said vessel, said means imparting a generally U-shaped flow pattern to said fluid at one of, prior to said fluid entering said bed or after said fluid exits said bed,

disposed at a location being one of between an outer wall of said housing and said bed or being a central conduit adapted to remove fluid from said vessel after passing through said bed with means provided in said baffle to permit a small amount of fluid flow through said vessel to by-pass said baffle;

whereby, fluid flow through said vessel from said means to introduce fluid into said bed to said means to remove said fluid from said bed is in a generally serpentine pattern.

5,814,130

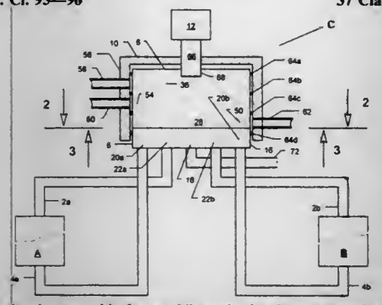
PROCESS AND APPARATUS FOR GAS SEPARATION

Norberto O. Lemcoff, Livingston; Mario A. Fronzoni, East Brunswick, both of N.J.; Michael E. Garrett, Woking; Brian C. Green, Brockham, both of England; Tim Atkinson, Jersey City, and Alberto I. La Cava, Guttenberg, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Sep. 27, 1996, Ser. No. 722,584

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—96 **37 Claims**



1. A valve assembly for providing selective flow communication between two conduits of a first set of fluid flow conduits and one conduit of a second set of fluid flow conduits, comprising first and second valve members having respective engaged surfaces relatively rotatable about a common center of rotation to provide valving action, said first valve member having a first set of equally spaced through apertures concentrically disposed at a first radius from said common center of rotation with each aperture being in fluid communication with one conduit of said first set of fluid flow conduits and a second set of equally spaced through apertures concentrically disposed at a second radius from said common center of rotation with each aperture being in fluid communication with one conduit of said second set of fluid flow conduits, said first and second sets of apertures comprising the same number of apertures; said second valve member having at least one first passage means which functions solely to selectively interconnect only two apertures of said first set of apertures and only one aperture of said second set of apertures; and drive means for effecting relative rotation of said valve members to enable rotationally cycled interconnection and fluid flow between two apertures of said first set of apertures and one aperture of said second set of apertures.

18. An adsorption system comprising the valve assembly of claim 1 and an array of adsorption vessels each having a feed inlet end and a product outlet end and containing an adsorbent which preferentially adsorbs one or more fluids of a fluid mixture, wherein each conduit of said first set of fluid flow conduits is connected to the product outlet end of one vessel of said array of adsorption vessels and each conduit of said second set of fluid flow conduits is connected to the feed inlet end of one vessel of said array of adsorption vessels.

5,814,131

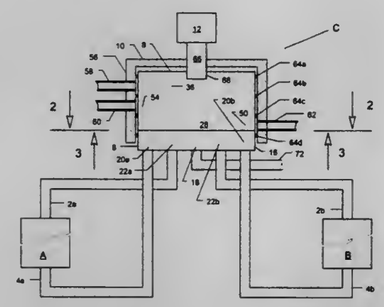
PROCESS AND APPARATUS FOR GAS SEPARATION

Norberto O. Lemcoff, Livingston; Mario A. Fronzoni, East Brunswick, both of N.J.; Michael E. Garrett, Woking; Brian C. Green, Brockham, both of England; Tim Atkinson, Jersey City, and Alberto I. La Cava, Guttenberg, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Sep. 27, 1996, Ser. No. 722,585

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—96 **37 Claims**



1. A valve assembly for providing selective flow communication between two conduits of a first set of fluid flow conduits and between two conduits of a second set of fluid flow conduits comprising first and second valve members having respective engaged surfaces relatively rotatable about a common center of rotation to provide valving action, said first valve member having a first set of equally spaced through apertures concentrically disposed at a first radius from said common center of rotation with each aperture being in fluid communication with one conduit of said first set of fluid flow conduits and a second set of equally spaced through apertures concentrically disposed at a second radius from said common center of rotation with each aperture being in fluid communication with one conduit of said second set of fluid flow conduits, said first and second sets of apertures comprising the same number of apertures; said second valve member having at least one first passage means which functions solely to selectively interconnect only two apertures of said first set of

apertures and at least one second passage means which functions solely to selectively interconnect only two apertures of said second set of apertures; and drive means for effecting relative rotation of said valve members to enable rotationally cycled interconnection and fluid flow between two apertures of said first set of apertures via said first passage means and between two apertures of said second set of apertures via said second passage means.

18. An adsorption system comprising the valve assembly of claim 1 and an array of adsorption vessels each having a feed inlet end and a product outlet end and containing an adsorbent which preferentially adsorbs one or more fluids of a fluid mixture, wherein each conduit of said first set of fluid flow conduits is connected to the product outlet end of one vessel of said array of adsorption vessels and each conduit of said second set of fluid flow conduits is connected to the feed inlet end of one vessel of said array of adsorption vessels.

5,814,132

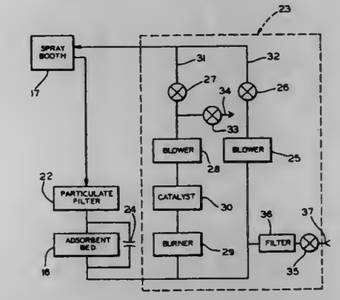
METHOD FOR VOC ABATEMENT AND PAINT SPRAY BOOTH INCORPORATING SUCH METHOD

Thomas E. Grime, Temperance, Mich.; Andrew P. Gargac, Oregon, Ohio, and Larry E. Campbell, Louisville, Tenn., assignors to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 509,423, Jul. 31, 1995, abandoned. This application Mar. 10, 1997, Ser. No. 815,333

Int. Cl.[6] B01D *53/04*

U.S. Cl. 95—123 **19 Claims**



1. A method for removing VOC's from a gas mixture comprising the steps of:

a) treating VOC adsorbent material consisting of an aluminosilicate gel desiccant with a masking agent consisting of water vapor to reduce the attraction of said adsorbent material for VOC's and to reduce a regeneration temperature for desorbing VOC's from said VOC adsorbent material, said VOC adsorbent material having a stronger attraction for such masking agent than for VOC's;

b) passing a flow of gas containing VOC vapor through the VOC adsorbent material treated with a masking agent to separate VOC's from the gas through adsorption of such VOC's in said treated VOC adsorbent material; and

c) regenerating said treated VOC adsorbent material at a temperature sufficiently high to drive off adsorbed VOC's from said treated VOC adsorbent material while below a higher temperature required to drive off the masking agent.

5,814,133

TREATMENT OF GAS STREAMS

Alex G. Hunter, and John L. Oakton, both of Bowburn, Great Britain, assignors to Process Scientific Innovations Limited, Durham, Great Britain

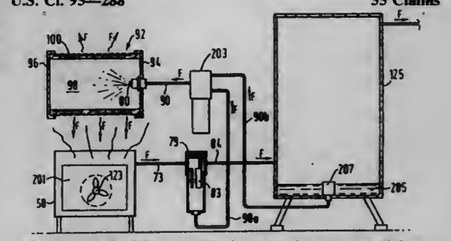
PCT No. PCT/GB95/00862, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/28219, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 13, 1995, Ser. No. 722,206

Claims priority, application United Kingdom, Apr. 15, 1994, 9407545; Nov. 23, 1994, 9423640

Int. Cl.[6] B01D *46/00*

U.S. Cl. 95—288 **55 Claims**



41. A method of disposing liquid contaminant extracted from a stream of compressed gas, said method comprising the steps of:

providing a closed hollow canister having at least one permeable wall through which gas and vapor but not liquid contaminants can pass freely and an atomizer providing an inlet to the interior of the canister;

feeding a waste stream of compressed gas and the extracted liquid contaminant to the atomizer so that as the waste stream and the liquid contaminant pass from the atomizer (i) the waste stream of compressed gas expands substantially to atmospheric pressure within the canister and (ii) the liquid contaminants become atomized and partly vaporized.

5,814,134

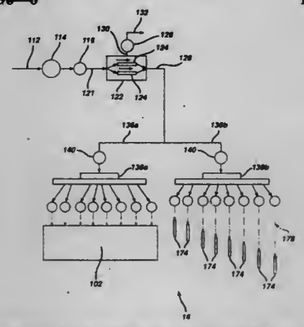
APPARATUS AND METHOD FOR DEGASSING DEIONIZED WATER FOR INSPECTION AND PACKAGING

Russell J. Edwards; Darren S. Keene, and Jonathan P. Adams, all of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 258,557, Jun. 10, 1994, Pat. No. 5,578,331, and a continuation-in-part of Ser. No. 432,957, May 1, 1995, Pat. No. 5,649,410. This application Feb. 15, 1996, Ser. No. 601,716

Int. Cl.[6] B01D *19/00*

U.S. Cl. 96—6 **13 Claims**



1. An apparatus for degassing deionized water for use in inspecting and packaging contact lenses, said apparatus comprising:

(a) a vacuum chamber;

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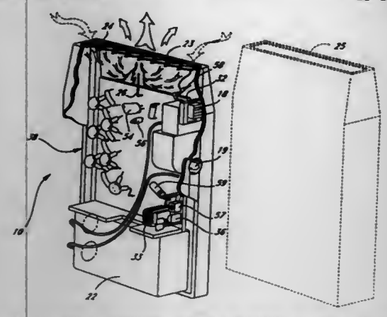
(b) a plurality of gas permeable tubes mounted within said chamber for sequentially receiving deionized water to be degassed;
(c) means for creating a pressure differential to cause said deionized water to flow through said plurality of gas permeable tubes;
(d) a manifold for distributing said degassed and deionized water to a plurality of distribution points;
(d) at least one precision metering pump for metering less than one ml of degassed and deionized water at each one of said distribution points.

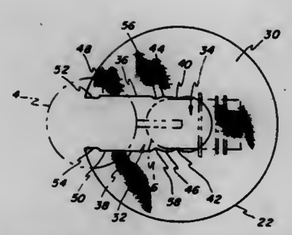
5,814,135
PORTABLE PERSONAL CORONA DISCHARGE DEVICE FOR DESTRUCTION OF AIRBORNE MICROBES AND CHEMICAL TOXINS
Stanley Weinberg, 575 Tigertail Rd., Los Angeles, Calif. 90049
Continuation-in-part of Ser. No. 696,624, Aug. 14, 1996, Pat. No. 5,667,564. This application Sep. 15, 1997, Ser. No. 931,101
Int. Cl.[6] B03C *3/32*
U.S. Cl. 96—58 **18 Claims**



10. A wearable personal corona discharge air purifier comprising:
an electric power source;
a metallic grid electrically connected to the electric power source;
a high voltage supply connectable to the electric power source for producing a voltage, the high voltage supply comprising:
a step-up power inverter for providing an alternating current with a greater peak to valley potential difference than a potential difference across the electric power source; and
a high voltage cascade multiplier connected to an output of the inverter to convert the alternating current into pulsating direct current, at an output of the cascade voltage multiplier; and
an emitter point connected to the output of the voltage multiplier and spaced apart from the metallic grid, for creating a corona discharge, negative ions formed by the corona discharge being accelerated towards the metallic grid by a potential difference between the grid and the emitter point.

5,814,136
DESICCANT CONTAINER
Raymond B. Wood, Brookville, Ohio, assignor to Stanhope Products Company, Brookville, Ohio
Filed Apr. 15, 1997, Ser. No. 837,985
Int. Cl.[6] B01D *53/04*
U.S. Cl. 96—147 **13 Claims**

1. A desiccant container comprising a housing defining a desiccant containing chamber, at least two fluid pervious sections in said housing each defining fluid ingress and egress ports respectively, said container further comprising an elongated slot extending lon-



gitudinally through said housing, said slot including two opposed upstanding longitudinally extending walls, each of said walls comprising a longitudinally extending first ridge member, said first ridge members defining therebetween a first transverse dimension adapted to engage a first tubular member.

5,814,137
SOL FOR COATING METALS
Kay Y. Blohowiak, Issaquah; Joseph H. Osborne, Tacoma, and Kenneth A. Krienke, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Nov. 4, 1996, Ser. No. 742,167
Int. Cl.[6] C04B *103/61;* **C09D** *5/08*
U.S. Cl. 106—14.13 **18 Claims**

1. A sol suitable for surface treatment of a metal to improve corrosion resistance and adhesion, comprising:
a) a dilute aqueous mixture of alkoxyzirconium, free of alcohol, for covalently bonding to the metal through the zirconium to form a metal-to-organic interface on the metal surface;
b) an organosilane coupling agent dissolved in the mixture;
c) an organic acid as a catalyst and as a stabilizer of the hydrolysis rate of the alkoxyzirconium; and
d) an effective amount ammonia or ammonium hydroxide to disrupt the the Zr-acetate complex that otherwise forms.

5,814,138
MICROWAVE DRYABLE THERMAL INK JET INKS
Gary R. Fague, Canandaigua, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 24, 1997, Ser. No. 788,146
Int. Cl.[6] C09D *11/02*
U.S. Cl. 106—31.43 **20 Claims**

1. A microwave dryable thermal ink jet ink comprising an aqueous liquid vehicle, a first co-solvent selected from the group consisting of formylethanolamine, acetylethanolamine, triethanolamine, trimethylolpropane, thiodiethanol, sulfolane and 1,3-dimethylimidazolidinone, ethylene glycol in an amount of from 0 to 15% by weight as an optional second co-solvent a colorant, and ammonium bromide.

5,814,139
BALLPOINT PEN PASTES WITH PHTHALOCYANINE PIGMENTS
Karin Heldrun Beck; Helmut Bellaire, both of Ludwigshafen; Erwin Czech, Biblis, and Walter Kurtz, Bad Dürkheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Filed Jul. 18, 1996, Ser. No. 683,465
Claims priority, application Germany, Jul. 27, 1995, 195 27 372.9
Int. Cl.[6] C09D *11/18*
U.S. Cl. 106—31.78 **5 Claims**

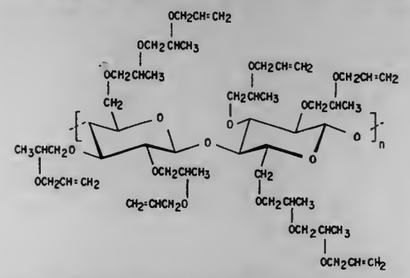
1. A process for preparing an essentially water-free ballpoint pen paste consisting essentially of a β-copper phthalocyanine pigment

with a particle size of <1 μm, a resin and an organic solvent, which comprises dry grinding a crude copper phthalocyanine pigment with an α-copper phthalocyanine content of 5 to 100%, to activate said pigment, kneading said pigment into the resin in the presence of water, while exposing said pigment to high shearing forces, thereby converting said pigment into finely divided β-copper phthalocyanine pigment, subsequently substantially removing the water by decanting, then grinding the cold pigment-resin preparation and dispersing it in the organic solvent.

5,814,140
PIGMENT PREPARATIONS SUITABLE FOR WATER-THINNABLE PRINTING INKS AND COATINGS
Hansulrich Reisacher, Sachsenheim, and Joachim Jesse, Weisenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Filed Mar. 12, 1997, Ser. No. 815,580
Claims priority, application Germany, Mar. 19, 1996, 196 10 702.4
Int. Cl.[6] C08K *5/00*
U.S. Cl. 106—31.89 **9 Claims**

1. Pigment preparations obtained by coating an organic pigment (a) suspended in an aqueous medium with a resin (b) having an acid number of ≧200 and with a nonionic surfactant (c), and isolating and optionally drying and mechanically comminuting the coated pigment.

5,814,141
LIQUID CRYSTALLINE CELLULOSE (ETHER) ETHERS AS INTERFERENTIALLY EFFECTIVE CHROMOPHORIC SUBSTANCES
Martin Kirschbaum; Maria-Theresia Saller, both of Ulm; Fritz Dannenhauer, Hasel, and Hartmut Seliger, Elchingen, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany
Filed Nov. 27, 1996, Ser. No. 757,236
Claims priority, application Germany, Nov. 27, 1995, 195 44 091.9
Int. Cl.[6] C09D *105/00*
U.S. Cl. 106—162.82 **29 Claims**

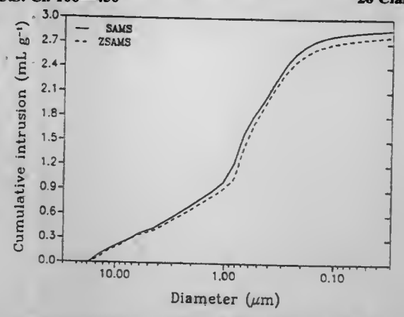


1. A liquid crystalline, photo cross-linkable main-chain polymer which is an interferentially effective, chromophoric substance for colored paints, comprising main mesogenic groups disposed at least approximately in a chiral-nematic manner, wherein the polymer is an etherified cellulose ether or a mixture of several etherified cellulose ethers wherein:
the cellulose ether has a molecular weight of 500 to 1,000,000,
the cellulose ether comprises anhydroglucose units which are etherified with an average degree of molar substitution of 2 to 7 with propylene oxide or ethylene oxide units (C_3H_6O- or C_2H_4O-units), and
the cellulose ether is etherified with an average degree of molar substitution of 1.5 to 3 with unsaturated hydrocarbon groups (C_nH_{2n-1}).

5,814,142

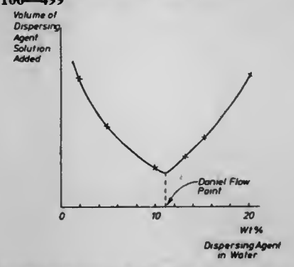
Patent Not Issued For This Number

5,814,143
ZIRCONIUM MODIFIED SYNTHETIC ALKALI METAL SILICATE PIGMENT AND METHOD OF MAKING
Gary M. Freeman, Macon, Ga., and Richard C. Zielke, Weaverville, N.C., assignors to J.M. Huber Corporation, Macon, Ga.
Filed Nov. 21, 1997, Ser. No. 976,230
Int. Cl.[6] C08K *3/00*
U.S. Cl. 106—450 **26 Claims**



1. In a white surface modified alkali metal silicate pigment, the improvement comprising an effective amount of an oxy-hydroxy zirconium species precipitated on a synthetic alkali metal silicate pigment surface to enhance at least the optical properties of the synthetic alkali metal silicate pigment.

5,814,144
AQUEOUS NON-BLOCKING TINTER FOR PAINTS
Jennifer Ruth Coutts, Wraysbury; Jonathan Albert Graystone, Maidenhead, and Trevor Stephen Beverley Sayer, Woosehill, all of England, assignors to Imperial Chemical Industries PLC, London, England
Continuation of Ser. No. 338,432, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 79,257, Jun. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 962,685, Oct. 19, 1992, abandoned. This application Aug. 3, 1995, Ser. No. 509,757
Int. Cl.[6] C08K *5/00*
U.S. Cl. 106—499 **12 Claims**



1. An aqueous non-blocking tinter for paints or similar coating compositions free of ethylene glycol and C_8 to C_{14} alkyl phenyl ethoxylates, said tinter having a viscosity at 20° C. of from 0.05 to 1.5 Ns/m^2 and containing solid particles of pigment dispersed in a dispersant system which comprises a mixture of at least about 59 wt % of water based on the weight of the dispersant system, and a

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dispersant having hydrophilic moieties and moieties capable of absorbing onto the surface of the pigment wherein

(a) the dispersant is water-miscible, micellising, has a vapour pressure of below 1.3N/m^2 at 25° C. and comprises at least one macromolecular essentially non-ionic composition comprising

(1) relatively long chain hydrophobic moiety having a chain length of at least 10 carbon atoms and capable of absorbing onto the surfaces of the pigment particles,

(2) relatively long chain hydrophilic moiety having an average chain length of from 20 to 250 atoms and

(3) optionally some anionic character if the composition has been made by a process involving the esterification of carboxylic acid groups and the esterification has not gone to completion

(b) the dispersant system also comprises a minor amount of less than 30 wt % of poly(ethylene glycol) having a weight average molecular weight of from 250 to 4,500 and

for a selected weight of pigment, the ratio of weight of water-miscible micellising dispersant to pigment is at least 5% greater than the ratio by weight of water-miscible micellising dispersant to pigment which would be present at the Daniel Flow Point of a notional tinter consisting only of the same pigment, water and the same water-miscible micellising dispersant but without component (b), the fluidity of said tinter being such that after the non-blocking tinter has been stored at 25° C. in a cylindrical bore 2 mm in diameter and 15 mm in length in an ambient relative humidity of 50% for 18 hours, a pressure of not more than 320 MN/m^2 is sufficient to cause the residual tinter to flow from the bore.

5,814,145

CEMENTATION SLURRIES FOR IMPROVEDLY ENCASING REINFORCING ELEMENTS THEREFOR

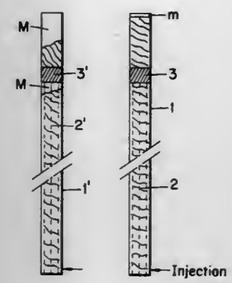
Jerome Dugat, Montigny-Le-Bretonneux; Laurent Frouin, L'Hay Les Roses; Evelyne Prat, Pantin, and Pierre Richard, Neuilly-Sur-Seine, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Mar. 21, 1995, Ser. No. 407,628

Claims priority, application France, Mar. 21, 1994, 94 03261

Int. Cl.^{6} C04B *14/04*

U.S. Cl. 106—737 **6 Claims**



1. In a cementitious composition of matter containing a cement matrix for use in encasing a reinforcing element therefor while reducing the risk of embrittlement thereof, the improvement which comprises from about 1.5% to 3% by weight of precipitated silica particles having an average size ranging from 0.3 to less than 20 micrometers which have a specific surface area of greater than about 200 m^2/g and which are fragmentable during mixing and/or injection into multiple fragments having particle sizes ranging from about 5 to 300 nanometers.

5,814,146

MDF CEMENT COMPOSITIONS WITH IMPROVED IMPACT STRENGTH

Rosa Di Maggio, Trento; Marcello Franchini, Tione Di Trento; Gianluca Guerrini, Cernusco Sul Naviglio; Claudio Migliaresi, and Stefano Poli, both of Trento, all of Italy, assignors to Italcementi S.P.A., Bergamo, Italy

PCT No. PCT/EP95/02586, § 371 Date Dec. 31, 1996, § 102(e) Date Dec. 31, 1996, PCT Pub. No. WO96/01234, PCT Pub. Date Jan. 18, 1996

PCT Filed Jul. 4, 1995, Ser. No. 765,427

Claims priority, application Italy, Jul. 6, 1994, MI94A001407

Int. Cl.^{6} C04B *24/00;21/02;24/12*

U.S. Cl. 106—802 **24 Claims**

1. In a macro defect free cement composition comprising a hydraulic cement, water, an organic polymer soluble or dispersable in water, and at least one 3D randomly dispersed alkali resistant discontinuous fiber, wherein 3D randomly dispersed refers to fibers uniformly dispersed inside the cement matrix, an alkali resistant fiber is a fiber which when exposed to an alkaline environment (pH 12.8) at 80° C. for 3000 hours in a cement slurry maintain at least 80% of mechanical characteristics with respect to not exposed fibers, wherein said macro defect free cement composition is homogenized by means of high shear stress mixing, the improvement of which comprises using fibers which after homogenization by high shear stress mixing maintain an aspect ratio L/Ed ranging from 50 and 700, wherein L stands for fiber length and Ed stands for equivalent diameter, said equivalent diameter being selected from the group consisting of fiber diameter, when the fiber has a circular section, and the quantity

$$\sqrt{4A/\pi}\ ,$$

wherein A is the area of the fiber cross section, when the fiber is not circular.

5,814,147

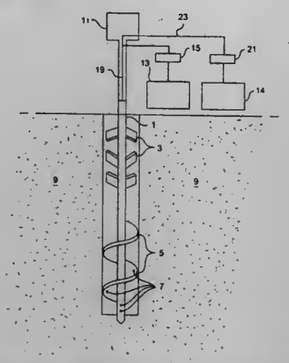
METHOD FOR STRENGTHENING AND IMPROVING CLAY SOILS

Gilbert Tallard, New York, N.Y., assignor to Envirotrench Company, Pelham, N.Y.

Filed Jan. 21, 1997, Ser. No. 784,549

Int. Cl.^{6} E02D *3/12*

U.S. Cl. 106—900 **12 Claims**



1. A method of strengthening and improving the load-bearing capacity of soft clay-containing subterranean soil and substantially reducing the waste volume by reducing the amount of water required to achieve a set consistency of the clay soil and the total quantity of cement required to achieve a specific strength comprising:

advancing a soil processing tool into soft clay-containing subterranean soil to break said soil into discrete particles;

while advancing said soil processing tool into said soil, introducing an aqueous composition consisting essentially of water and a clay dispersant in an amount sufficient to disperse said discrete particles and make absorbed water from said clay available for hydration of subsequently added cement;

when the soil processing tool has reached its set depth, withdrawing same and simultaneously adding during said withdrawal an aqueous cementitious composition comprising water and a cement in a water-to-cement weight ratio of 0.4 to 1:1 and in an amount that together with the water released from said clay and said aqueous dispersant containing composition, provides a cementitious composition having a weight ratio of water to cement of about 2 to 6:1; and

allowing said mixture to harden.

5,814,148

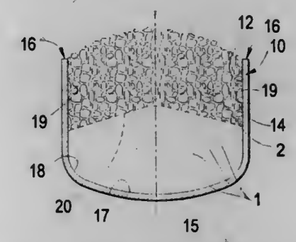
METHOD FOR PREPARING MOLTEN SILICON MELT FROM POLYCRYSTALLINE SILICON CHARGE

Kyong-Min Kim, St. Charles, and Leon A. Allen, Grover, both of Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Feb. 1, 1996, Ser. No. 595,075

Int. Cl.^{6} C30B *15/14*

U.S. Cl. 117—13 **34 Claims**



26. A process for preparing a silicon melt in a crucible for use in growing a single crystal silicon ingot by the Czochralski method, the process comprising

loading granular and chunk polycrystalline silicon into a crucible, the crucible having a centerline and an inner surface which includes a wall, the granular polycrystalline silicon being loaded to a height at the centerline of the crucible which is greater than its height at the wall, the chunk polycrystalline silicon being loaded onto the granular polycrystalline silicon, and

melting the granular polycrystalline silicon and the chunk polycrystalline silicon to form a silicon melt.

5,814,149

METHODS FOR MANUFACTURING MONOCRYSTALLINE DIAMOND FILMS

Yoshihiro Shintani, Tokushima; Takeshi Tachibana, Hyogo; Kozo Nishimura, Hyogo; Koichi Miyata, Hyogo; Yoshihiro Yokota, Hyogo, and Koji Kobashi, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

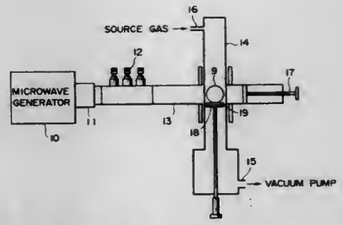
Filed Nov. 17, 1995, Ser. No. 560,077

Claims priority, application Japan, Nov. 25, 1994, 6-315975

Int. Cl.^{6} C30B *29/04*

U.S. Cl. 117—104 **30 Claims**

1. A method for forming monocrystalline diamond films by chemical vapor deposition (CVD) on substrates which are made of platinum or its alloys and have either (111) or (001) crystal surfaces and/or inclined crystal surfaces with angular deviations



within ±10 degrees from (111) or (001), respectively, on the substrate surfaces entirely or at least partly.

5,814,150

METHOD OF AND APPARATUS FOR FORMING SINGLE-CRYSTALLINE THIN FILM, BEAM IRRADIATOR, BEAM IRRADIATING METHOD AND BEAM REFLECTING DEVICE

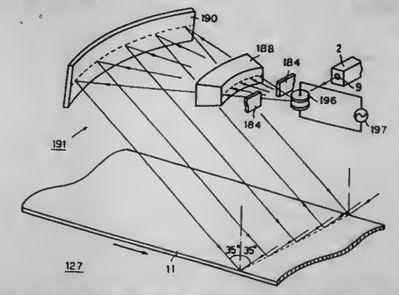
Toshifumi Asakawa, Yamato; Masahiro Shindo, Suita; Toshikazu Yoshimizu, Suita, and Sumiyoshi Ueyama, Suita, all of Japan, assignors to Neuralsystems Corporation, Tokyo-to, and Mega Chips Corporation, Suita, both of Japan

Division of Ser. No. 239,969, May 9, 1994, abandoned. This application Feb. 7, 1996, Ser. No. 598,115

Claims priority, application Japan, Oct. 14, 1993, 5-281748; Oct. 20, 1993, 5-285674; Dec. 10, 1993, 5-341281; Mar. 29, 1994, 6-058887

Int. Cl.^{6} C30B *1/02*

U.S. Cl. 117—200 **4 Claims**



1. A beam reflecting device for reflecting a gas beam being supplied from a single beam source thereby enabling irradiation of a target surface of a sample with said gas in a plurality of prescribed directions of incidence, said beam reflecting device comprising:

a reflector having a plurality of reflecting surfaces for reflecting said beam in a plurality of directions; and

a screen being interposed in a path of said beam between said beam source and said reflecting surfaces for selectively passing said beam thereby preventing multiple reflection by said plurality of reflecting surfaces.

5,814,151

APPARATUS FOR SPRAYING PHOTORESIST

Gyu-myeung Lee, Anyang, and Ill-jin Jang, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 19, 1997, Ser. No. 825,224

Claims priority, application Rep. of Korea, Mar. 19, 1996, 1996 7379

Int. Cl.^{6} B05B *7/00;* **B05C** *11/00;* **B65D** *83/00*

U.S. Cl. 118—300 **7 Claims**

1. A photoresist spraying apparatus comprising:

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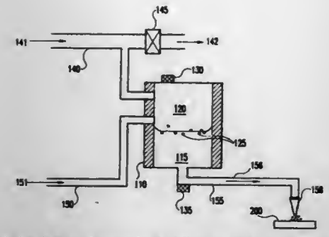


a tank having a photoresist holding portion and an air portion located above said photoresist holding portion;

photoresist inflow conduit connected to a sidewall of the photoresist holding portion of the tank for admitting a photoresist to the photoresist holding portion of the tank;

a photoresist outflow conduit connected to the bottom of the photoresist holding portion of the tank for discharging the photoresist to a nozzle for spraying the photoresist onto a semiconductor wafer,

a gas conduit having a gas inlet, a gas outlet and a connecting portion therebetween, the connecting portion being connected to the sidewall of the air portion of the tank and not extending inside the tank; and

a valve, provided in the gas outlet of the gas conduit, for regulating a pressure inside the tank.

5,814,152

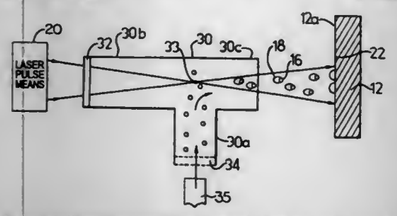
APPARATUS FOR COATING A SUBSTRATE

Stephen L. Thaler, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Division of Ser. No. 447,403, May 23, 1995, Pat. No. 5,612,099. This application Aug. 8, 1996, Ser. No. 694,332

Int. Cl.[6] B05B *5/00;* **B65D** *83/06*

U.S. Cl. 118—641 **4 Claims**



1. An applicator assembly for coating a surface of a substrate, the applicator assembly comprising:

a coating applicator comprising:

a trunk portion having first and second opposed ends; and

a pair of arm portions extending outwardly from and in fluid communication with the first end of said trunk portion;

a plug disposed within the second end of said trunk portion such that particulates of a coating material can be held within said trunk portion of said coating applicator, wherein said plug is porous such that an inert gas can be injected therethrough to urge the particulates of coating material into said arm portions of said coating applicator; and

laser pulse means for generating a series of pulses of laser energy to irradiate a plurality of particulates of coating material which have been urged into said arm portions of said coating applicator by the inert gas such that at least a first portion of the plurality of irradiated particulates are melted to form a plurality of at least partially molten droplets of coating material, wherein the series of pulses generated by said laser pulse means ablates a second portion of the irradiated particles to thereby create a plurality of ablation plumes associated with respective droplets of the at least partially molten droplets and which propel the respective at least partially molten droplets toward the substrate such that the at least partially molten droplets adhere to the substrate, thereby coating the surface of the substrate.

5,814,153

SEMICONDUCTOR DEVICE MANUFACTUIRING APPARATUS

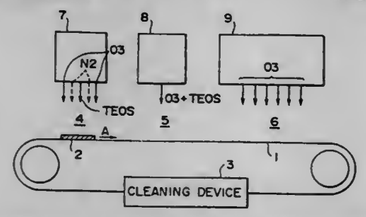
Yoshimitsu Ishikawa, Nagaskai, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 615,778, Mar. 14, 1996, Pat. No. 5,693,579. This application Jun. 27, 1997, Ser. No. 884,500

Claims priority, application Japan, Mar. 15, 1995, 7-084704

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—719 **13 Claims**



1. A semiconductor device manufacturing apparatus comprising:

a transporting part for transporting a semiconductor substrate;

a first film forming part and a second film forming part arranged along a transporting direction of said semiconductor substrate in said transporting part;

said first film forming part being provided with a gas supplying means for supplying gases onto said semiconductor substrate while a plurality of reaction gases are being separated from each other through an inert gas; and

said second film forming part being provided with a gas supplying means for supplying premixed mixture gas having said plurality of reaction gases onto the semiconductor substrate.

5,814,154

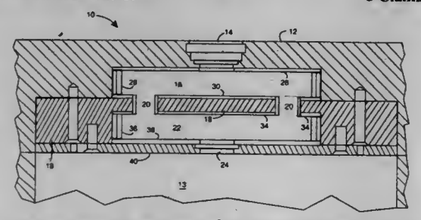
SHORT-COUPLED-PATH EXTENDER FOR PLASMA SOURCE

Charles A. Boitnott, Half Moon Bay, Calif., assignor to GaSonics International, San Jose, Calif.

Filed Jan. 23, 1997, Ser. No. 788,602

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 R **8 Claims**



1. A short-coupled-path extender for insertion between a plasma source and a semiconductor wafer vacuum chamber, comprising:

a first antechamber for receiving a plasma source flow from a plasma source;

a transverse metal wall providing for blinding of ultraviolet radiation from reaching a process wafer and a separation between the first antechamber and a wafer processing chamber, and further includes a system of perforations that allows said plasma source flow to pass from the first antechamber to said wafer processing chamber;

wherein, an entering plasma source flow is made to encounter a traverse metal wall, at a back of the first antechamber and is forced to flow radially outward to a system of small outer ports.

5,814,155

PLASMA ASHING ENHANCEMENT

Ramiro Solis, and Mark Arnold Levan, both of San Antonio, Tex., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 26, 1996, Ser. No. 672,477

Int. Cl.[6] C25F *1/00*

U.S. Cl. 134—1 **17 Claims**

4. A process for enhancing sidewall polymer removal comprising the steps of:

introducing O_2 into an ashing environment;

introducing H_2O vapor into said ashing environment such that etching of oxide material is suppressed; and

selectively ashing, within said ashing environment, sidewall polymer material.

5,814,156

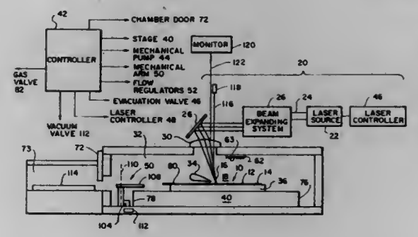
PHOTOREACTIVE SURFACE CLEANING

David J. Elliott, Wayland, and Richard F. Hollman, Chelmsford, both of Mass., assignors to UVTech Systems Inc., Wayland, Mass.

Continuation-in-part of Ser. No. 697,018, Aug. 16, 1996, Pat. No. 5,669,979, which is a continuation of Ser. No. 532,992, Sep. 25, 1995, abandoned, and a continuation-in-part of Ser. No. 647,145, May 9, 1996, abandoned, which is a continuation of Ser. No. 428,667, Apr. 25, 1995, abandoned, which is a continuation-in-part of Ser. No. 298,023, Aug. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 118,806, Sep. 8, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 745,711

Int. Cl.[6] B08B *3/12*

U.S. Cl. 134—1 **34 Claims**



1. A photoreactive method of removing foreign material from a surface of a substrate to form a non-solid by-product comprising the steps of:

providing a flow of a gaseous reactant in a reaction region in the vicinity of said foreign material; and

delivering a beam of radiation to aid said gaseous reactant to react with said foreign material to form said non-solid by-product;

said beam of radiation and said gaseous reactant interacting in said reaction region to create a foreign material reaction environment that chemically interacts with and that removes said foreign material from said substrate surface and converts said foreign material to said non-solid by-product.

5,814,157

METHOD FOR CLEANING A SEMICONDUCTOR WAFER WITH AN IMPROVED CLEANING SOLUTION

Tetsuo Mizuniwa, and Yoshimi Shiramizu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 14, 1996, Ser. No. 645,812

Claims priority, application Japan, May 15, 1995, 7-140014

Int. Cl.[6] C23G *1/02;* **B08B** *3/08*

U.S. Cl. 134—1.2 **26 Claims**

1. A method for cleaning a solid-state material to remove organic and metallic contaminants from a surface of the solid-state material, said method comprising a single step of contacting said solid-state material with a cleaning solution which contains a chlorine compound acting as an oxidant, which has a pH value in the range of 1 to 3, and which has an oxidation-reduction potential in the range of 800 mV to 1200 mV when measured on the basis of a saturated calomel electrode at a temperature of 25° C., for a sufficient period of time to reduce the concentration of metallic and organic contaminants to a level of not more than 2×10^9 atoms/cm^2.

5,814,158

METHOD OF CLEANING PROBE TIPS OF CARDS AND APPARATUS FOR IMPLEMENTING THE METHOD

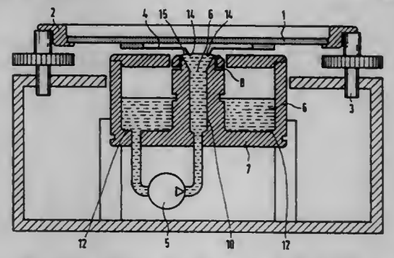
Egon Holländer, Zürich, and August Riedo, Dietikon, both of Switzerland, assignors to U.S. Philips Corporation, NY, N.Y.

Filed Apr. 3, 1996, Ser. No. 626,095

Claims priority, application European Pat. Off., Apr. 19, 1995, 95200989

Int. Cl.[6] C23G *1/02;* **B08B** *3/04;3/08*

U.S. Cl. 134—3 **8 Claims**



1. A method of cleaning probe cards provided with probe tips for making electrical contact with test pads of electrical devices, in which method the tips are cleaned of a contaminating material through exposure of the tips to a cleaning solution, comprising the steps of maintaining an upper surface of the cleaning solution at a substantially constant and controlled level, and dipping the probe tips in the cleaning solution such that only their ends touch the cleaning solution.

5,814,159

CLEANING METHOD

William R. Paley, Wayne; Steven J. Paley, Paramus; Douglas W. Cooper, Ramsey; Peter B. Russo, Califon; Jeffrey C. Sayre, Oakland; Howard D. Siegerman, Hillsdale, and Robert N. Amabile, Hiawatha, all of N.J., assignors to The Texwipe Company LLC, Upper Saddle River, N.J.

Continuation of Ser. No. 527,153, Sep. 12, 1995, abandoned, which is a continuation-in-part of Ser. No. 402,113, Mar. 10, 1995, abandoned. This application Feb. 24, 1997, Ser. No. 803,781

Int. Cl.[6] B08B *7/00;* **B65D** *79/00*

U.S. Cl. 134—6 **13 Claims**

1. A cleaning method comprising the steps of:

(a) providing a cleaning kit comprising at least one absorbent cleaning applicator and a first liquid-tight container contain-

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ing a cleaning liquid, both contained within a second container, one of said cleaning liquid and said applicator being subject to deterioration due to prolonged contact with the other, the quantity of said cleaning liquid being from at least enough to moisten said applicator to more than 100% of the quantity needed to saturate said applicator;

(b) releasing said cleaning liquid from said first container into said applicator by puncturing said first container at a time proximate the time when said applicator is to be used for cleaning;

(c) removing said applicator from said second container; and

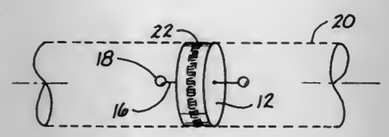
(d) utilizing said applicator for cleaning.

5,814,160

METHOD AND APPARATUS FOR MAINTAINING CLEAN TUBING

Michael A. Orlando, Westminster, Calif., assignor to McDonnell Douglas Corp., Long Beach, Calif.

Filed Nov. 26, 1996, Ser. No. 756,367
Int. Cl.[6] B08B *9/00;9/02*
U.S. Cl. 134—8 **20 Claims**



1. A cleaning plug for maintaining a piece of tubing clean during a manufacturing and handling operations having a longitudinal axis and an inner diameter, said cleaning plug comprising:

a compressible portion having an outer wall of sufficient diameter for contacting and maintaining a seal along said tubing inner diameter and for preventing contamination from passing across said seal, said compressible portion made from an expandable foam having a slow recovery period such that when compressed, said compressible portion naturally expands back to an original configuration;

a grasping member coupled to the compressible portion and adapted to facilitate the insertion and removal of the compressible portion into the piece of tubing; and

wherein said compressible portion is compressible to a diameter smaller than said tubing inner diameter and expands sufficiently slowly such that the cleaning plug is insertable into the piece of tubing without contacting said tubing inner diameter.

5,814,161

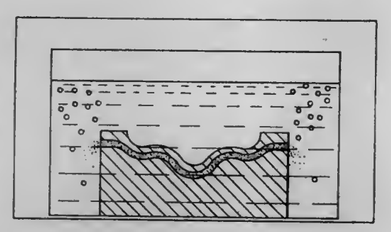
CERAMIC MOLD FINISHING TECHNIQUES FOR REMOVING POWDER

Emanuel M. Sachs, Newton; Michael J. Cima, Lexington; James F. Bredt, Watertown, all of Mass.; Satbir Khanuja, Lakewood, Ohio, and Richard Li-chao Yu, San Carlos, Calif., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 983,156, Nov. 30, 1992, Pat. No. 5,490,882, and Ser. No. 551,012, Oct. 31, 1995. This application Feb. 12, 1996, Ser. No. 600,215
Int. Cl.[6] B08B *5/04;9/00*
U.S. Cl. 134—21 **3 Claims**

1. A process for removing loose powder from interior passages of a body made by layer manufacturing techniques comprising the steps of:

placing the body within a bath of water charged with CO_2 within a vessel;



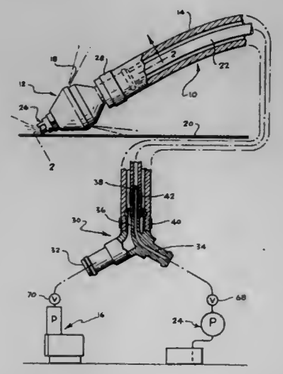
rapidly lowering the pressure in the vessel so as to cause the CO_2 to come out of solution as bubbles, including within the interior passages of the body, the bubbles of CO_2 thereby causing the expulsion of loose powder.

5,814,162

AIR AND SPRAY NOZZLE

John M. Barrett, Williamsville, and Thomas P. Moore, Buffalo, both of N.Y., assignors to Collom International, Inc., Buffalo, N.Y.

Filed Sep. 25, 1996, Ser. No. 719,471
Int. Cl.[6] B08B *9/04*
U.S. Cl. 134—22.12 **15 Claims**



14. A process to cleanse a pipe line with a nozzle system connected via a first supply conduit to a first source of medium, and wherein the cleaning means has at least one nozzle opening which is directed backwards towards the first supply conduit at an acute angle relative to a center line which extends through a fastening of the first supply conduit to the nozzle system, and the first medium being made to discharge through the nozzle opening and in part clean inner walls of a pipe line and force the nozzle system to move into the pipe line by the force resulting from the discharge of the first medium from the nozzle opening, said process including the steps of bringing the nozzle system into contact with the inner wall of a pipe line, a reduced pressure is established on opposite sides of the nozzle opening, and the nozzle system is made to move around about the cross-section of the pipe line; and

said process is repeated along with the discharging of a second medium from a nozzle sprayer of said nozzle discharging a second medium which is directed forward from the first supply conduit, said second medium is supplied to said nozzle by a second supply conduit enclosed within said first supply conduit and connected to a second source of medium.

5,814,163

COMPOSITION AND PROCESS FOR CLEANING INKS FORM VARIOUS SURFACES INCLUDING PRINTING PLATES

Gerald Wojcik, Thomaston, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Filed Sep. 9, 1996, Ser. No. 711,052
Int. Cl.[6] B08B *7/00;* **C11D** *9/00;9/04*
U.S. Cl. 134—39 **19 Claims**

12. A process for cleaning organic residues from a substrate, said process comprising contacting the substrate with a composition comprising:

a. at least one monoester;

b. at least one methyl ester;

c. at least one linear olefinic hydrocarbon and

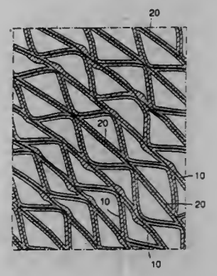
d. 2,2,4-trimethyl-1,3-pentanediol mono (2-methyl propanoate).

5,814,164

THIN-WALLED, MONOLITHIC IRON OXIDE STRUCTURES MADE FROM STEELS, AND METHODS FOR MANUFACTURING SUCH STRUCTURES

Alexander Shustorovich; Eugene Shustorovich, both of Pittsford, N.Y.; Richard Montano, Falls Church, Va.; Konstantin Solntsev, Moscow, Russian Federation; Yuri Buslaev, Moscow, Russian Federation; Sergei Myasoedov, Moscow, Russian Federation, and Vyacheslav Morgunov, Moscow, Russian Federation, assignors to American Scientific Materials Technologies L.P., New York, N.Y.

Filed Nov. 9, 1994, Ser. No. 336,587
Int. Cl.[6] C01G *49/06;49/08*
U.S. Cl. 148—287 **18 Claims**



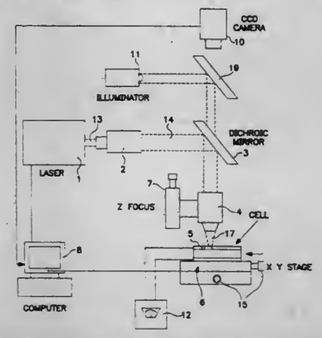
1. A method for making a monolithic iron oxide structure comprising providing an iron-containing metal structure and heating the iron-containing metal structure in an oxidative atmosphere having an oxygen source consisting essentially of free oxygen at a temperature below the melting point of iron to oxidize the iron-containing structure and directly transform the iron to iron oxide, wherein the iron is first oxidized to hematite to transform the iron-containing structure to a hematite monolithic structure, and the hematite monolithic structure is then heated at a temperature of about 1350° to about 1550° C. to de-oxidize the hematite to magnetite, such that the magnetite monolithic structure retains substantially the same shape, size and wall thickness as the hematite structure.

5,814,165

UV LASER ANNEALING AND CLEANING OF DEPOSITED METAL AND DIELECTRIC LINES

Abdelkrim Tatah, Arlington, and Carl V. Thompson, Acton, both of Mass., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan, and Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 717,926, Sep. 23, 1996, abandoned. This application Nov. 24, 1997, Ser. No. 977,924
Int. Cl.[6] C21D *1/04*
U.S. Cl. 148—565 **9 Claims**



1. A method for simultaneously reflowing a deposited metal or dielectric line on a glass substrate and cleaning deposited metal particles deposited in the vicinity of the line comprising the steps of:

(a) providing a glass substrate containing deposited metal particles, a deposited metal line and/or dielectric line;

(b) generating an ultraviolet laser beam;

(c) focusing said ultraviolet laser beam onto said line in an atmospheric environment; and

(d) causing relatively large deposited metal particles to migrate to the line and evaporating small particles of deposited metal debris by exposing a portion of said line to said ultraviolet laser beam for about 5 seconds to heat said substrate and reflow said line;

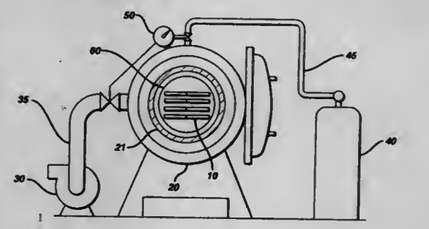
wherein the resistivity of said line improves by at least about 5 micro-ohms per centimeter.

5,814,166

PROCESS FOR HEAT TREATING AND TEMPERING SURGICAL NEEDLES

Douglas Warren Ackerman, Gainesville, Ga.; Timothy Sardelis, Somerset, and William McJames, Belle Mead, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 14, 1996, Ser. No. 748,875
Int. Cl.[6] C21D *9/26*
U.S. Cl. 148—606 **11 Claims**



1. A continuous process for heat treating and tempering stainless steel surgical needles, the process comprising

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initially placing a plurality of martensitic stainless steel surgical needles into an oven having an internal chamber, and exposing the needles to a sufficient vacuum at room temperature for a sufficient time to effectively remove surface volatile contaminants from the outer surfaces of the needles, said needles comprising a stainless steel containing alloy elements;

increasing the chamber temperature to a temperature less than or equal to 700° C. while maintaining a sufficient vacuum for a sufficient period of time to effectively remove higher temperature volatile surface contaminants from the outer surface of the needles while preventing the loss of alloy elements contained in the stainless steel;

then injecting an inert gas into the chamber at a pressure greater than or equal to 1 Torr, thereby cooling the needles and retaining the alloy elements;

heating the gas to a sufficient temperature and maintaining the gas at said temperature at a pressure of at least 1 Torr for a sufficient amount of time to effectively heat treat the needles;

lowering the temperature of the chamber to a sufficiently low temperature to allow the effective formation of the martensitic phase;

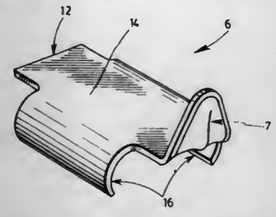
raising the temperature of the gas to a sufficient temperature and exposing the needles to a sufficient vacuum and maintaining said temperature and vacuum for a sufficient period of time to effectively temper the needles while maintaining the chamber pressure of at least 1.0 Torr.

5,814,167

STAMPED-METAL CLIP FOR USE WITH AN ENDLESS TRACK BELT COOPERATING WITH SLIDE RAILS

Maurice Beaudoin, 850, 111e Avenue, Drummondville, Québec, Canada, J2B 4L2

Filed Dec. 27, 1996, Ser. No. 774,889
Int. Cl.[6] B62D *55/08;* **C21C** *8/00*
U.S. Cl. 148—639 **9 Claims**



1. A method for improving a stamped-metal clip for use with an endless track belt cooperating with slide rails, the stamped-metal clip being made of steel and including a main portion having a bearing surface to be engaged against at least one of the slide rails and a fastening portion to fasten the main portion to the track belt, the method comprising the steps of:

a) austenizing only the main portion of the clip; and

b) quenching the entire clip at a temperature providing a hardness of the main portion higher than 35 HRC.

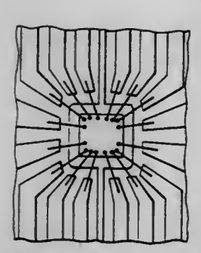
5,814,168

PROCES FOR PRODUCING HIGH-STRENGTH, HIGH-ELECTROCONDUCTIVITY COPPER-BASE ALLOYS

Koichi Hatakeyama; Akira Sugawara, and Toshihiro Kanzaki, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1996, Ser. No. 662,695
Claims priority, application Japan, Oct. 6, 1995, 7-287826
Int. Cl.[6] C22F *1/08*
U.S. Cl. 148—682 **16 Claims**

6. A process for producing a high-strength, high-electroconductivity copper alloy which comprises the steps of



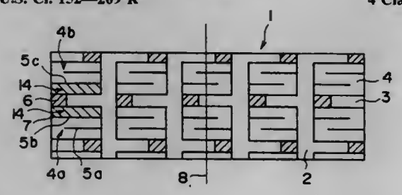
heating an ingot of a copper alloy consisting of 0.1–0.3 wt % Fe, 0.1–0.3 wt % Ni, 0.03–0.1 wt % P, not more than 30 ppm of oxygen, and optionally a total of 0.03–0.5 wt % of at least one of Sn and Zn and a total of 0.05–0.5 wt % of at least one element selected from the group consisting of Ag, B, Mn, Cr, Si, Ti and Zr, with the balance being Cu and incidental impurities, to a temperature of 800°–950° C., and hot working to a reduction ratio of 50% or more to form a hot worked reduced thickness ingot, quenching the hot worked reduced thickness ingot from a temperature of 600° C., or above down to 300° C., or below at a cooling rate of at least 1° C./sec, heat treating the resultant quenched reduced thickness ingot at a temperature of 380°–520° C., for 60–600 min, without performing cold working, and subsequently performing cold working and a heat treatment at 450° C. or below, whereby an Fe—Ni—P system intermetallic compound is precipitated in the Cu matrix as uniform and fine grains not larger than 50 nanometers.

5,814,169

PNEUMATIC TIRE INCLUDING SIPES

Yuji Yamaguchi, and Chishiro Tanabe, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 323,718, Oct. 18, 1994, abandoned.
This application May 6, 1996, Ser. No. 643,532
Claims priority, application Japan, Nov. 18, 1993, 5-289211; Aug. 11, 1994, 6-189312
Int. Cl.[6] B60C *11/12*
U.S. Cl. 152—209 R **4 Claims**



1. A pneumatic tire having

a tread provided with blocks separated by circumferential grooves extending around the tread and lateral grooves crossing the circumferential grooves, the blocks being provided with plural lateral sipes, and

each block having one block portion and another block portion, a first lateral end portion and a second lateral end portion of the one block portion being substantially separated by a lateral sipe, and a third lateral end portion and a fourth lateral end portion of the another block portion being substantially separated by a lateral sipe, the first lateral end portion of each block being less rigid than the second lateral end portion of each block and the fourth lateral end portion of each block being less rigid than the third lateral end portion of each block,

the blocks including a row of blocks having one side and an opposite side, the first lateral end portions and the third lateral end portions being on the one side of the row of blocks, and the second lateral end portions and the fourth lateral end portions being on the opposite side of the row of blocks,

the first and second lateral end portions of one block and the first and second lateral end portions of another block being separated from each other by one of the lateral grooves, the third and fourth lateral end portions of the another block and the third and fourth lateral end portions of a block adjacent to the another block being separated by another lateral groove,

a plurality of reinforcing means being located in the lateral grooves to redress a difference of rigidity between lateral end portions of each block portion, the plurality of reinforcing means being alternately arranged such that one of said plurality of reinforcing means is on the one side of the row of blocks and in the one lateral groove which separates the first lateral end portions and another of said reinforcing means is on the opposite side of the row of blocks in the another lateral groove which separates the fourth lateral end portions, each reinforcing means not being located in a circumferential groove;

wherein each reinforcing means is a platform and the height, the length in the circumferential direction, and the lateral width of the platform are respectively 0.25–0.7.5 times as large as the depth of a respective one of the lateral grooves, 0.5–1.0 times as large as the width of the respective one lateral groove, and 0.2–0.5 times as large as the width of a respective one of said blocks.

5,814,170

MANUFACTURING METHOD FOR A WOOD COMPOSITE LAYERED MATERIAL

Tatsuya Shibusawa; Sumire Kawamoto; Hideaki Korai, and Tsuyoshi Fujii, all of Ibaragi, Japan, assignors to The Forestry and Forest Research Institute, Japan

Division of Ser. No. 753,897, Dec. 2, 1996. This application Feb. 24, 1997, Ser. No. 806,017
Claims priority, application Japan, Aug. 22, 1996, 8-238673
Int. Cl.[6] B32B *5/28;31/18*
U.S. Cl. 156—62.2 **17 Claims**

1. A method for manufacturing a composite multi-layered material, comprising the steps of:

(a) splitting a fibrous raw material comprising at least one of wood and bamboo along a fiber direction to form a first plurality of elongated pieces of said raw material;

(b) further splitting said first plurality of elongated pieces of said raw material along the fiber direction to form a second plurality of elongated pieces of said raw material;

(c) drying said second plurality of elongated pieces of said raw material to form elongated dried pieces;

(d) arranging said elongated dried pieces substantially parallel to one another in at least a first structural layer;

(e) applying a first adhesive agent to said elongated dried pieces in said first structural layer to cause said elongated dried pieces to be adhered together in a first adhered structural layer;

(f) arranging at least said first adhered structural layer with at least one vibration/shock-absorbing layer in a plurality of layers in an alternating manner to form a multi-layered structure;

(g) pressing said multi-layered structure to a predetermined thickness thereby causing said plurality of layers to adhere to one another to provide said multi-layered structure as a unitary body;

wherein said at least one vibration/shock absorbing layer is obtained by the steps of:

(h) providing a plurality of small pieces comprising at let one of wood and bamboo which are smaller than said elongated dried pieces;

(i) drying said small pieces to form small dried pieces;

(j) distributing said small substantially uniformly in said at least one vibration/shock absorbing layer; and

(k) applying a second adhesive agent to said small dried pieces to cause said small dried pieces to be adhered together in a first adhered vibration/shock absorbing layer;

(l) providing a plurality of resin pellets as load bearing elements;

(m) distributing said resin pellets in said at least one vibration/shock absorbing layer; and

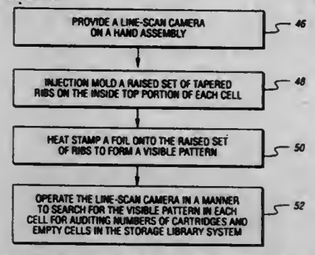
(n) applying said second adhesive agent to said plurality of resin pellets to cause said resin pellets to be adhered together in said first adhered vibration/shock absorbing layer.

5,814,171

CELL AUDITING SCHEME FOR STORAGE LIBRARY SYSTEM

Joseph P. Manes, Arvada; Donald B. Walt, Boulder; Robert S. Creager, Berthood; Adam Mehlberg, Longmont; John S. Todor, Arvada; Joseph P. Falace, Lousiville, and Scott D. Wilson, Westminster, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 15, 1996, Ser. No. 751,134
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—64 **8 Claims**



8. A method of auditing cartridges and empty cells in a storage library system including a plurality of fixed cells for storing cartridges and further including a robotically actuated hand assembly, wherein each cell includes an inside top portion, the method comprising:

providing a line-scan camera on the hand assembly;

injection molding a raised set of tapered ribs on the inside top portion of each of the plurality of cells;

heat stamping a foil onto said raised set of ribs to form a visible pattern within each cell such that the visible pattern is readable by the line-scan camera when the line-scan camera is moved to a position adjacent the particular cell if the particular cell is empty and such that the presence of a cartridge within the particular cell would prevent viewing of the visible pattern within the cell by the line-scan camera; and

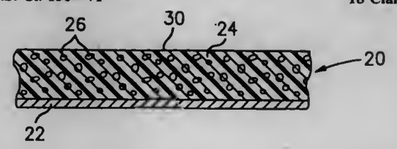
operating the line-scan camera in a manner to search for the visible pattern within each cell for auditing numbers of cartridges and empty cells in the storage library system.

5,814,172

THERMOPLASTICS SHEETS FOR PROTECTING SUBMARINE STRUCTURES

Arthur R. Cox, 6300 Rocking Horse Rd., Jupiter, Fla. 33458, and Samuel M. Boszor, 9723 Heather Cir. E., Palm Beach Gardens, Fla. 33410

Filed Jul. 8, 1996, Ser. No. 677,689
Int. Cl.[6] B63B *59/04*
U.S. Cl. 156—71 **18 Claims**



1. A method of inhibiting marine growth on a structure exposed to a submarine environment which comprises:

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forming a sheet having a portion comprised of a biocide particulate having an average particle size diameter of greater than 5 microns dispersed in a polymerized first resin which is thermoplastic; the sheet portion having isotropic mechanical properties and being inelastically elongatable within the plane of the sheet;

adhering the sheet to the surface of the structure in combination with stretching the sheet to thereby permanently elongate the sheet in the plane of the sheet, to provide a barrier to the submarine environment;

wherein, a portion of the biocide particulate in the sheet is exposed to the submarine environment.

5,814,173

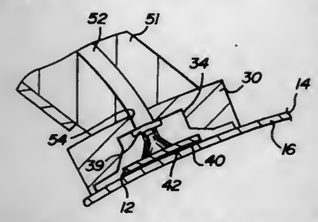
APPARATUS AND METHOD FOR POSITIVELY LOCATING AND ATTACHING AN EMBLEM ON A VEHICLE

Charles L. Stone, Metamora, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jul. 31, 1996, Ser. No. 690,664

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—71 **15 Claims**



1. A method for positively locating and attaching an emblem to a vehicle comprising these steps of:

providing a frame having a retention member;

placing an emblem on the retention member wherein the retention member exerts a retention force on the emblem to hold the emblem in place;

engaging the frame at a predetermined position on the vehicle and positively locating the position of the emblem on the vehicle; and

creating a vacuum around the retention member and forcing the surface of the vehicle against the retention member to transfer the emblem from the retention member to the vehicle.

5,814,174

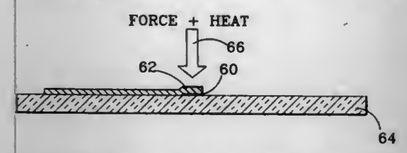
METHOD FOR REPAIR OF METALLIZATION ON CIRCUIT BOARD SUBSTRATES

Stewart O. Fong, Torrance, Calif., assignor to Hughes Electronics Corporation, Los Angeles, Calif.

Filed Jun. 17, 1996, Ser. No. 664,657

Int. Cl.[6] B29C *73/04;* **B32B** *35/00*

U.S. Cl. 156—94 **16 Claims**



1. A method for repair of metallization that has lifted from a circuit board substrate, comprising the steps of:

obtaining one or more pieces of dry film adhesive, said adhesive sized to cover an area approximately equal to the area of the lifted metallization,

placing said dry film adhesive between said substrate and said lifted area of metallization,

applying force to said lifted area of metallization to keep the lifted area in contact with said dry film adhesive and said dry film adhesive in contact with said substrate,

heating said dry film adhesive while applying said force until said adhesive melts and cures, thereby reattaching said lifted area of metallization to said substrate,

bonding an electrical conductor to said lifted area of metallization, wherein said force is applied to said conductor and thereby to said lifted area of metallization, and whereby said heating simultaneously bonds said conductor to said metallization and melts and cures said adhesive to reattach said metallization to said substrate, and

removing said force and said heat.

5,814,175

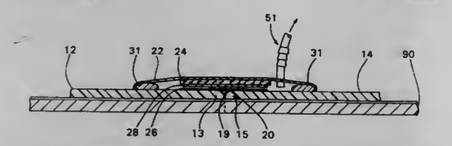
WELDED THERMOPLASTIC POLYMER ARTICLE AND A METHOD AND APPARATUS FOR MAKING SAME

Steven E. Rau, Oxford; Brian G. Morris, Lincoln University, both of Pa., and Robert W. Sauer, Newark, Del., assignors to Edlon Inc., Avondale, Pa.

Filed Jun. 7, 1995, Ser. No. 480,799

Int. Cl.[6] B29C *65/02*

U.S. Cl. 156—157 **18 Claims**



1. A method for welding together abutting edges of adjacent sheets of thermoplastic material comprising:

first positioning an electrically resistive heating element formed of flexible strip material upon the adjacent sheets so as to substantially cover said edges to be welded together;

next forming an air impermeable collapsible enclosure over the heating element and the sheet edges to be welded together and for holding air, said enclosure having an outer surface and an inner surface;

evacuating the air from within the enclosure so that as the air is so evacuated, there is applied to the outer surface of the enclosure atmospheric pressure which compresses the inner surface against the heating element and the heating element against the sheet edges;

activating the heating element while the heating element is compressed against the sheet edges to melt the thermoplastic material of the sheet edges; and

isolating the heating element from the sheet edges while the thermoplastic material is softened by interposing a protective layer of a non-stick strip material between the heating element and the sheet edges, whereby incorporation of the heating element into the weld is avoided.

5,814,176

PROCESS FOR FORMING DOUBLE-STRAND MONOFILAMENT LINE FOR USE IN FLEXIBLE LINE TRIMMERS

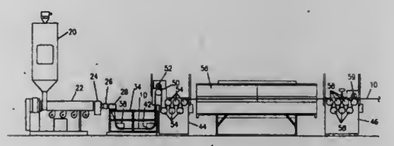
Richard A. Proulx, Alta Loma, Calif., assignor to Proulx Manufacturing, Inc., Rancho Cucamonga, Calif.

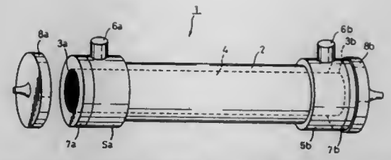
Filed Feb. 6, 1996, Ser. No. 597,178

Int. Cl.[6] A01D *50/00*

U.S. Cl. 156—167 **16 Claims**

13. A process for forming a flexible cutting line comprised of two monofilament strands joined together in a side-by-side disposition by a readily severable weld for use in rotary vegetation trimmers, said process comprising the following steps: extruding a





pair of molten monofilament strands in proximate disposition; directing said molten strands in a spaced apart disposition into a cooling quench bath; then directing said strands into side-by-side parallel contact within said bath; and pulling said strands in side-by-side parallel contact through the bath to effect crystallization and bonding together of the two strands.

5,814,177

Patent Not Issued For This Number

5,814,178

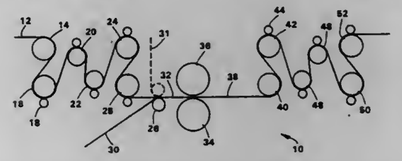
PROCESS FOR MAKING A BULKED FABRIC LAMINATE

Rob L. Jacobs, Woodstock, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 30, 1995, Ser. No. 496,876

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—290 **16 Claims**



1. A process for producing a three dimensionally texturized liquid resistant laminate comprising a fibrous layer and a liquid resistant layer, said liquid resistant layer having a higher latent shrinkability than said fibrous layer, which process comprising the steps of:

a) placing said fibrous layer and said liquid resistant layer in juxtaposition to form a laminate,

b) attaching said fibrous layer and said liquid resistant layer of said laminate at a plurality of spaced-apart point bond sites,

c) heating said bonded laminate to a temperature that activates the latent shrinkability of said liquid resistant layer, and

d) allowing the heated laminate to retract such that said liquid resistant layer shrinks and said fibrous layer forms gathers between said bond sites, thereby forming a three dimensional texture and heat annealing said laminate.

5,814,179

PROCESS FOR PRODUCING A BLOOD DIALYZER

Satoru Ohmori; Hironori Matsuda; Takahiro Daido, and Takeyuki Kawaguchi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 260,566, Jun. 16, 1994, abandoned. This application May 28, 1996, Ser. No. 654,312

Claims priority, application Japan, Jun. 21, 1993, 5-149249; Nov. 16, 1993, 5-286754; Mar. 24, 1994, 6-53568

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—294 **11 Claims**

1. A process for producing a blood dialyzer comprising the steps of:

subjecting a plurality of artificial composite fibers each comprising a core portion composed of a water-insoluble core liquid consisting of at least one aliphatic paraffin compound having 10 to 30 carbon atoms, and a sheath portion consisting of a fiber-forming polymer surrounding the core portion, to a removal of almost all of the core liquid from the core portion to convert the composite fibers to hollow fibers each having a hollow space located in the longitudinal center portion thereof and extending along the longitudinal axis thereof;

forming a bundle from the resultant artificial hollow fibers;

packing the artificial hollow fiber bundle in a cylindrical case having open ends thereof to produce a blood dialyzer module;

sealing the end portions of spaces left between the artificial hollow fiber peripheries and between the artificial hollow fiber bundle and the inside surface of the cylindrical case, with a bonding resin material, and thereby fixing the artificial hollow fiber bundle to the cylindrical case at the end portions thereof; and

cleaning the artificial hollow fibers with a cleaning liquid comprising at least one aliphatic monohydric alcohol having 3 to 8 carbon atoms, by flowing the cleaning liquid through the hollow spaces of the artificial hollow fibers at a temperature of from 10° C. to 50° C.

5,814,180

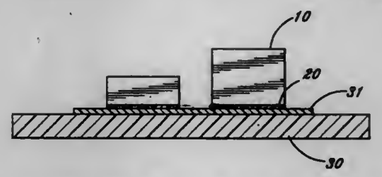
LOW TEMPERATURE METHOD FOR MOUNTING ELECTRICAL COMPONENTS

David Robert King, Elkton, Md., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 465,021, Jun. 5, 1995, Pat. No. 5,604,026, which is a continuation-in-part of Ser. No. 147,196, Nov. 3, 1993, abandoned. This application Aug. 9, 1996, Ser. No. 689,448

Int. Cl.[6] C09J *5/08;9/02*

U.S. Cl. 156—333 **1 Claim**



1. A low temperature method for mounting an electronic component, said method comprising the following steps:

providing an electrically conductive pressure sensitive adhesive material which is effective to adhesively bond to an object of interest at a temperature of less than about 90° C., said electrically conductive adhesive defined by a substantially planar substrate having first and second outer surfaces and numerous open passageways through the substrate defined by a plurality of walls, said walls having disposed thereon a layer of conductive metal, said open passageways being filled with a pressure sensitive adhesive resin at passageway locations near the first and second surfaces, wherein the electrically conductive pressure sensitive adhesive material permits an electric current to flow from a first surface, through the planar substrate, to a second surface thereof;

providing a predetermined electronic component;

providing a conductive mounting surface;

affixing the first surface of the electrically conductive pressure sensitive adhesive to the electronic component; and

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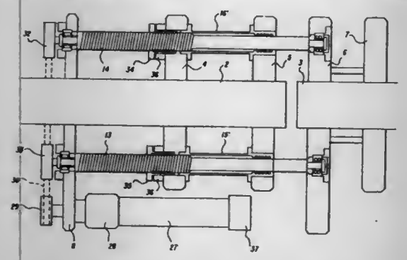
affixing said second surface of the electrically conductive pressure sensitive adhesive to the conductive surface thereby mounting the electronic component in electrical communication with the conductive mounting surface.

5,814,181
DEVICE FOR BUTT WELDING PIPES OF THERMOPLASTIC PLASTIC

Ulrike Richter, Ringstrasse 5, 36399 Freiensteinau-Holzmühl, Germany, and Wilfried Hufnagel, Vienna, Austria, assignors to Ulrike Richter, Germany

Filed Nov. 16, 1995, Ser. No. 558,542
Claims priority, application Germany, Nov. 21, 1994, 44 41 135.9; Oct. 3, 1995, 195 36 857.6
Int. Cl.[6] B29C *65/20*
U.S. Cl. 156—351 **7 Claims**



1. A device for butt welding pipes comprising a thermoplastic plastic, said device comprising a support structure, means for heating ends of said pipes to a particular welding temperature, a first pipe clamping unit connected to said support structure for clamping a first of said pipe ends therein, and a second pipe clamping unit connected to said support structure for clamping a second of said pipe ends therein, said first and second clamping units being aligned flushed relative to each other, said first pipe clamping unit being movable relative to said support structure in a direction of alignment of said pipe ends by an electric motor via mechanical drive elements comprising at least one rotatable driven threaded spindle being axially affixed on one of the pipe clamping units and cooperating in a self-locking manner with a nut nonrotatably and in both axial directions drivingly connected to the other of the pipe clamping units for pressing said first pipe end clamped therein against the second pipe end clamped in the second pipe clamping unit, which is fixed relative to said support structure, with a force rising with a predetermined gradient measurable by a measurement device, the torque of the electric motor being regulated in a closed control circuit as a function of measurement values of at least one of a force, pressure, and torque of said measurement device, said measurement device being disposed on at least one of said mechanical drive elements of the first pipe clamping unit.

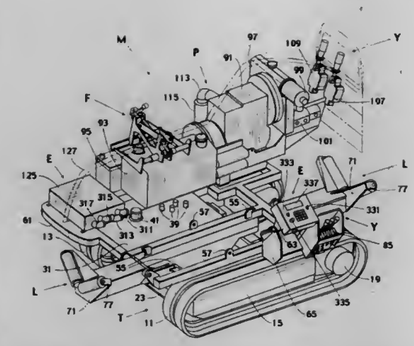
5,814,182
SELF-CONTAINED AND SELF-PROPELLED MACHINE FOR HEAT FUSING POLYOLEFIN PIPES

Arthur H. McElroy, II; David W. Porter; Kean C. Chin, all of Tulsa, and Richard A. Deaver, Broken Arrow, all of Okla., assignors to McElroy Manufacturing, Inc., Tulsa, Okla.

Filed Sep. 19, 1997, Ser. No. 934,305
Int. Cl.[6] B32B *31/00;* **G05G** *15/00*
U.S. Cl. 156—358 **20 Claims**

1. A machine for end-to-end welding of polyolefin pipes comprising:

a pair of tracks parallel with a longitudinal axis and rotatable in forward and reverse directions;



a frame connecting said tracks for movement therewith along said longitudinal axis;

first jaws fixed to said frame for gripping a first pipe in alignment with said longitudinal axis;

second jaws slidably mounted on said frame for reciprocal movement along said longitudinal axis for gripping a second pipe in longitudinal alignment with respect to the first pipe;

drive means mounted on said frame for rotating said tracks and reciprocating said second jaws;

first control means mounted on said frame and connected to said drive means for controlling rotation of said tracks;

means insertable between the pipes with said second jaws deactivated in an apart condition for simultaneously facing opposed ends of the aligned pipes with said second jaws activated toward a "together" condition until the opposed ends of the pipes are in parallel planes;

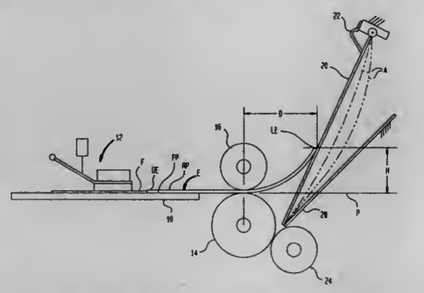
means insertable between the faced ends of the pipes with said second jaws deactivated in an apart condition for simultaneously heating the faced ends of the pipes to a molten condition with said second jaws activated toward a "together" condition; and

second control means mounted on said frame and connected to said drive means for controlling the reciprocation of said second jaws and for monitoring the temperature of said heating means to bring the fused pipe ends to a molten condition and to bond the molten pipe ends together.

5,814,183
METHOD AND MECHANISM FOR SEALING AN ENVELOPE

Carl A. Miller, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 3, 1993, Ser. No. 55,477
Int. Cl.[6] B43M *3/00*
U.S. Cl. 156—442.2 **2 Claims**



1. A mechanism for sealing an envelope, said envelope having front and rear panels, said panels being joined along a lower edge

and not joined along an upper edge, and having a sealable flap joined to said front panel along said upper edge, said mechanism comprising:

a) a first means for moving said envelope along a path, said envelope being oriented with said lower edge forward, said front panel proximate to said path, and said flap open;

b) a second means for capturing said upper edge as it clears said first means and for folding and sealing said flap against said rear panel, said second means having an intake proximate to said path for receiving said upper edge;

c) stop means displaced from said path for engaging said lower edge and urging said upper edge towards said intake; and,

d) resilient deflecting means for deflecting said lower edge towards said stop means at a variable rate of deflection, said rate of deflection varying inversely with the stiffness of said envelope to prevent buckling of said envelope:

wherein said first and second means comprise first and second pairs of rollers, respectively;

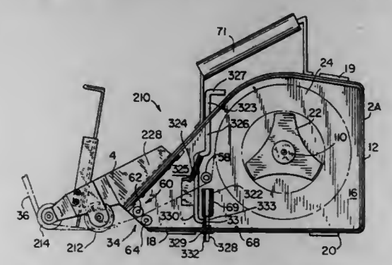
wherein said intake comprises the nip of said second pair of rollers;

wherein said resilient deflecting means comprises a substantially straight extended element formed from a resilient material and having a first end fixed proximate to said stop means and a second end positioned proximate to said nip, said element deflecting in response to contact with said envelope to reduce the rate at which said lower edge is deflected sufficiently so that said envelope does not buckle.

5,814,184
HAND OPERATED MUDLESS DRYWALL TAPE APPLICATOR

Jeffrey L. Denkins, W1952 County S, Kaukauna, Wis. 54130

Filed Oct. 25, 1995, Ser. No. 547,996
Int. Cl.[6] B65H *35/07*
U.S. Cl. 156—577 **20 Claims**



1. An apparatus for applying adhesive-backed joint tape over flat joints between sections of wall, the apparatus comprising:

a housing having a tape outlet;

a tape holder mounted to the housing for holding a roll of adhesive-backed joint tape;

a tape guide positioned in the housing by the tape outlet, the tape guide having a non-stick surface exposed to an adhesive surface of the joint tape;

a positioning roller mounted to the housing in a fixed location relative to the tape guide, the positioning roller being located so that the non-adhesive surface of the joint tape contacts the positioning roller when the joint tape passes the positioning roller as the joint tape dispenses from the roll of joint when on the tape holder through the tape outlet, wherein the tape holder provides a sufficient amount of tension on the roll of tape so that contact of the non-adhesive surface of the joint tape maintains contact against the positioning roller when the joint tape is being applied over flat joints between sections of wall, thereby aligning the joint tape dispensing through the tape guide in a consistent direction from the positioning roller which does not vary as the roll of joint tape becomes smaller during use;

a cylindrical application roller having a resilient surface, the application roller being mounted to the housing and positioned to the exterior of the housing near the tape outlet so that the application roller contacts a non-adhesive surface of the joint tape as the joint tape dispenses through the tape outlet;

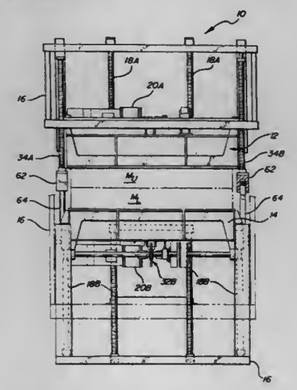
an operator actuated tape break that secures the joint tape from dispensing from the tape holder through the tape outlet in the housing when actuated, wherein the operator actuated tape break secures the the tape by squeezing the tape against the positioning roller; and

a tape cutter to selectively cut joint tape dispensing from the apparatus at a location between the tape outlet and the application roller, the tape cutter cutting the joint tape from the side of the non-adhesive surface of the joint tape.

5,814,185
TWIN SHEET THERMOFORMER

Victor L. Chun, Midland; Stephen E. Keeley, Coleman, and James H. Kundinger, Auburn, all of Mich., assignors to Kvaerner U.S. Inc., South Attleboro, Mass.

Filed Oct. 1, 1997, Ser. No. 941,826
Int. Cl.[6] B29C *51/00*
U.S. Cl. 156—580 **12 Claims**



1. A twin sheet thermoformer apparatus including:

a frame;

an upper platen for mounting an upper thermoforming mold, said upper platen movable up and down on said frame through a range of positions thereof;

upper platen positioner means including platen drive means for selectively moving said upper platen to any position in said range of positions, said positioner means also including means for holding said upper platen stationary at positions within said range;

a lower platen for mounting a lower thermoforming mold on said frame, said lower platen positioned on said frame below said upper platen and movable up and down thereon towards and away from said upper platen through a range of positions;

lower platen positioning means including platen drive means for selectively moving said lower platen to any position in said range of positions, said positioning means also including means for holding said lower platen stationary at positions within said range;

a first set of vertical locking shafts mounted to said upper platen and a second set of vertical locking shafts mounted to said lower platen, each locking shaft in said second set aligned with a respective locking shaft in said first set;

coupling means operable to couple said first and second sets of locking shafts together after said upper and lower platen are moved together to a predetermined spacing therebetween;

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adjustment means causing one of said first or second sets of locking shafts to be selectively adjusted so that said predetermined spacing between said upper and lower platen whereat said coupling means is operable is varied; and,

adjustment drive means for driving each of said adjustment means to cause simultaneous adjustment of said locking shafts in said one of said first or second sets, whereby uniform adjustment of said predetermined spacing is carried out.

5,814,186

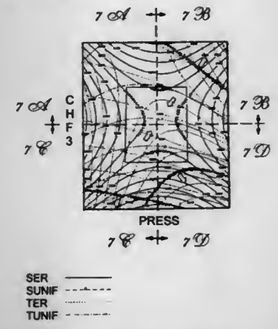
SOG ETCHANT GAS AND METHOD FOR USING SAME

Thien T. Nguyen, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 520,311, Aug. 28, 1995, abandoned. This application Aug. 19, 1996, Ser. No. 699,211

Int. Cl.[6] H01L *21/3065*

U.S. Cl. 156—643.1 **8 Claims**



1. A semiconductor etch process comprising:

providing a semiconductor wafer topography, wherein said semiconductor wafer topography comprises a semiconductor substrate and a patterned metal layer on said substrate, said patterned metal layer comprising densely patterned trace elements and sparsely patterned trace elements;

depositing an oxide layer upon said semiconductor wafer topography;

spin depositing a silicate material upon said oxide layer, wherein a first thickness of said silicate material over said densely patterned trace elements is less than a second thickness of said silicate material over said sparsely patterned trace elements; and

performing a single step etch of said silicate material in a plasma etch reactor chamber with an etchant comprising CHF_3, O_2, and Ar with approximate flow rates of 60 sccm, 15 sccm, and 266 sccm, respectively, wherein said etchant etches said silicate material at a rate approximately 1.5 times the rate at which said etchant etches said oxide layer such that there is less than a 3.0% variance in the uniformity of the remaining SOG thickness relative to the uniformity of the initial SOG thickness across the entire semiconductor wafer topography.

5,814,187

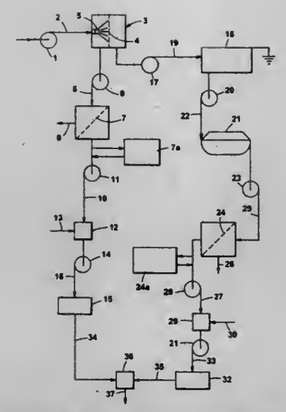
APPARATUS AND METHOD FOR TREATING A PULP SLURRY OF WASTE PAPER

Roland Fjallstrom, Lawrenceville, Ga., assignor to Alfa Laval Celleco AB, Tumba, Sweden

Filed Apr. 14, 1993, Ser. No. 45,684

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—4 **8 Claims**



1. A method of treating a pulp slurry of waste paper containing relatively large deformable impurities of strings, foils and clumps of glue, and relatively fine impurities of small particles, printing ink and filler material, including ashes and clay, the method comprising the steps of:

spraying the pulp slurry in the form of jets through a gaseous medium,

screening said jets of pulp slurry such that the pulp slurry is fractionated into a rejected first aqueous fraction containing relatively long fibres and the large impurities, and an accepted second aqueous fraction containing relatively short fibres and substantially all of the fine impurities, and

screening said aqueous first fraction of the pulp slurry, without substantially deforming the large impurities therein, such that said first aqueous fraction is separated into a rejected third aqueous fraction containing the large impurities, and an accepted fourth aqueous fraction containing the long fibres.

5,814,188

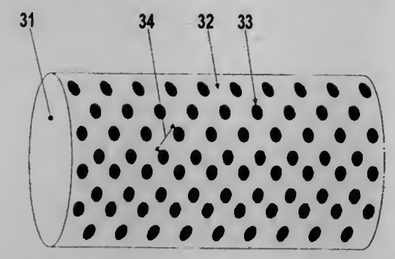
SOFT TISSUE PAPER HAVING A SURFACE DEPOSITED SUBSTANTIVE SOFTENING AGENT

Kenneth Douglas Vinson; Paul Thomas Weisman, both of Cincinnati, Ohio; Jonathan Andrew Flcke, Lawrenceburg, Ind., and Thomas James Klofta, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 31, 1996, Ser. No. 777,829

Int. Cl.[6] D21H *21/22*

U.S. Cl. 162—109 **19 Claims**



1. A soft tissue paper product having one or more plies, wherein at least one outer surface of the tissue paper has uniform discrete surface deposits of a substantively affixed chemical softening agent, wherein said surface deposits are spaced apart at a frequency between about 5 deposits per lineal inch and about 100 deposits per lineal inch, said chemical softening agent being selected from the group consisting of quaternary ammonium compounds and polysiloxanes.

5,814,189

METHOD FOR GASIFYING CELLULOSE SPENT LIQUOR TO PRODUCE SUPERHEATED STEAM AND GREEN LIQUOR OF LOW CARBONATE CONCENTRATION

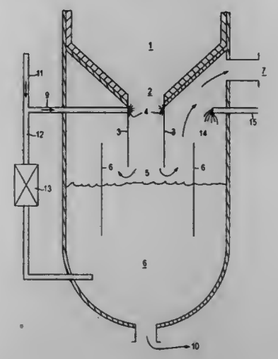
Lars Stigsson, Bjarred, and Nils Bernard, Taby, both of Sweden, assignors to Kvaerner Pulping AB, Karlstad, Sweden

Continuation-in-part of Ser. No. 769,928, Dec. 9, 1996, abandoned, which is a continuation of Ser. No. 293,165, Aug. 19, 1994, abandoned, which is a continuation of Ser. No. 949,523, Nov. 25, 1992, abandoned. This application Feb. 3, 1997, Ser. No. 794,409

Claims priority, application Sweden, May 31, 1990, 9001957

Int. Cl.[6] D21C *11/04*

U.S. Cl. 162—30.11 **18 Claims**



1. A process for the preparation of an aqueous solution of alkaline compounds from a generator combustible gas containing carbon monoxide, carbon dioxide, hydrogen and entrained alkaline compounds, wherein said generator combustible gas has been formed during partial combustion of cellulose spent liquors in a gas generator, the process comprising the steps of:

a) transferring said generator combustible gas through a vertically arranged downcomming tube into a quench vessel partially filled with a green liquor, an upper part of said downcomming tube being connected to an opening of said gas generator and a lower part either terminating above the surface of said green liquor or terminating below the surface of said green liquor, said quench vessel having at least one inlet being connected to and opening into said downcoming tube for supplying one or more aqueous cooling and dissolving liquids into said downcoming tube, said aqueous cooling and dissolving liquids being injected into said downcoming tube in an amount to cool said generator combustible gas to a predetermined temperature above the steam saturation temperature at a prevailing pressure in said quench vessel by evaporative cooling of said generator gas to produce a combustible gas comprising superheated steam and alkaline compounds, and wherein when said downcoming tube terminates below a surface of said green liquor said downcoming tube comprises at least one opening allowing said generator combustible gas to pass out from said downcoming tube;

b) separating said alkaline compounds from said combustible gas of step (a) in said quench vessel to thereby form a combustible gas comprising superheated steam and is substantially-free of alkaline compounds; and

c) dissolving said alkaline compounds in said green liquor.

5,814,190

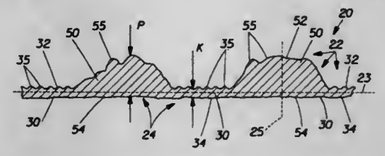
METHOD FOR MAKING PAPER WEB HAVING BOTH BULK AND SMOOTHNESS

Dean Van Phan, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 462,239, Jun. 5, 1995, Pat. No. 5,776,312, which is a continuation-in-part of Ser. No. 268,213, Jun. 29, 1994, Pat. No. 5,556,509, Ser. No. 461,832, Jun. 5, 1995, Ser. No. 268,154, Jun. 29, 1994, abandoned, and Ser. No. 439,526, May 11, 1995, which is a division of Ser. No. 268,133, Jun. 29, 1994, Pat. No. 5,549,790. This application Nov. 14, 1996, Ser. No. 748,872

Int. Cl.[6] B31F *1/12;* **D21H** *15/02*

U.S. Cl. 162—111 **12 Claims**



1. A method of forming a paper web, the method comprising the steps of:

providing an aqueous dispersion of papermaking fibers;

providing a foraminous forming member;

depositing the aqueous dispersion of papermaking fibers on the foraminous forming member;

forming an embryonic web of the papermaking fibers on the foraminous forming member, the embryonic web having a first surface and a second surface;

providing a web support apparatus having a web facing side comprising a first web contacting surface and a second web contacting surface, wherein a difference in elevation between the first and second web contacting surfaces is less than the thickness of the embryonic web;

transferring the embryonic web from the foraminous forming member to the web support apparatus wherein the first surface of the web is supported on the first and second web contacting surfaces of the web support apparatus;

imparting a predetermined pattern to the first surface of the web at a web consistency of between about 10 and about 60 percent;

providing a heated drying surface;

transferring the web to the heated drying surface at a web consistency of between about 20 and about 60 percent, wherein substantially all the second surface of the web is positioned adjacent the heated drying surface; and

creping the web from the heated drying surface.

5,814,191

ARRANGEMENT AND METHOD FOR COMBINING A DILUTION FLOW WITH A STOCK FLOW PASSED OUT OF AN INLET HEADER IN A PAPER/BOARD MACHINE

Jyrki Huovila, Muurame, Finland, 40950, assignor to Valmet Corp., Helsinki, Finland

Filed Jun. 20, 1997, Ser. No. 879,597

Claims priority, application Finland, Jun. 20, 1996, 962567

Int. Cl.[6] D21F *1/08*

U.S. Cl. 162—216 **23 Claims**

21. A method for regulating the basis weight of a web upon its discharge from a headbox of a paper/board machine, comprising the steps of:

passing a stock flow from an inlet header of the headbox through conduit means comprising a plurality of conduits extending across a width of the headbox,

introducing dilution liquid into the stock flow in at least one of said conduits by passing the dilution liquid through at least one of a plurality of dilution flow ducts each leading to at least two of said conduits situated at a discrete position along

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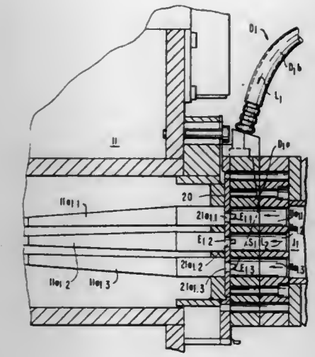


the width of the headbox, said at least one dilution flow duct being defined by walls and including a narrowing duct portion having an upstream end and a downstream end, a cross-sectional area defined by said walls at said upstream end being greater than a cross-sectional area defined by said walls at said downstream end, and passing the dilution liquid from said at least one dilution flow duct through at least two branch ducts in flow communication with said narrowing duct portion of said at least one dilution flow duct and into one of said conduits,

regulating the flow of the dilution liquid through said dilution flow ducts to thereby regulate the basis weight of the web, and

discharging the stock flow including the dilution liquid from the headbox to form the web.

5,814,192

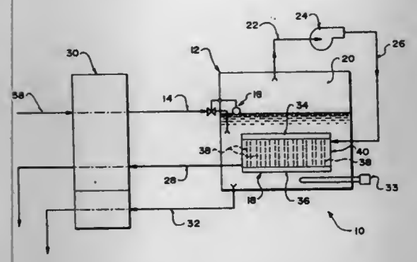
VAPOR COMPRESSION DISTILLATION APPARATUS

Lee Pittmon, Post Falls, Id.; Randy Wasilenko, St. Nelson, Canada, and Brian Fisk, Portland, Oreg., assignors to Terra Mannix Inc., Calgary, Canada

Filed Oct. 3, 1996, Ser. No. 720,783

Int. Cl.[6] B01D *3/14;* **F28F** *13/12*

U.S. Cl. 202—182 **15 Claims**



1. A heat exchanger of the shell and tube type, comprising first and second manifolds, tubes connecting the manifolds for sassing a first fluid therebetween, and a shell having an inlet and an outlet, said shell surrounding the tubes for confining a flow of a second fluid from the inlet to the outlet for heat exchange with the first fluid, said heat exchanger including sparging means for injecting bubbles of gaseous second fluid into the bottom manifold to pass through the liquid first fluid passing through the tubes.

5,814,193

PROCESS FOR THE PURIFICATION OF A C_2 TO C_4 CARBOXYLIC ACID AND/OR ANHYDRIDE HAVING HALIDE IMPURITIES

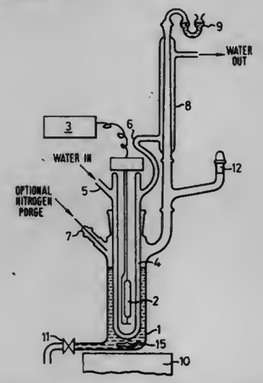
Barry Crowe, East Yorkshire, England, assignor to BP Chemicals Limited, London, England

Filed Aug. 9, 1996, Ser. No. 695,273

Claims priority, application United Kingdom, Aug. 17, 1995, 9516892; Feb. 21, 1996, 9603611

Int. Cl.[6] C07C *51/00;1/00;51/42*

U.S. Cl. 204—157.87 **14 Claims**



1. A process for the purification of a C_2 to C_4 carboxylic acid, a C_2 to C_4 anhydride, or a mixture thereof having halide impurities, which process comprises the steps of (a) exposing the impure acid, anhydride or mixture thereof to electromagnetic radiation under conditions of intensity, wavelength and temperature to convert at least a portion of the halide impurities to lower boiling halide components, higher boiling halide components or mixtures thereof and (b) separating the halide components formed in step (a) from the C_2 to C_4 carboxylic acid, anhydride or mixture thereof.

5,814,194

SUBSTRATE SURFACE TREATMENT METHOD

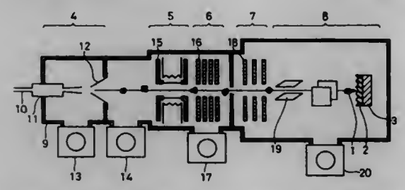
Masahiro Deguchi, Osaka; Akihisa Yoshida, Kyoto; Makoto Kitabatake, Nara, and Takashi Hirao, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd, Osaka, and Research Development Corporation of Japan, Saitama, both of Japan

Filed Oct. 12, 1995, Ser. No. 542,008

Claims priority, application Japan, Oct. 20, 1994, 6-254024; Mar. 28, 1995, 7-069943; Mar. 28, 1995, 7-069944

Int. Cl.[6] C30B *33/12*

U.S. Cl. 204—192.1 **16 Claims**



1. A substrate surface treatment method comprising the steps of:

forming cluster particles comprising a plurality of atoms or molecules;

accelerating said cluster particles; and

irradiating accelerated cluster particles onto a surface of a substrate in a reduced pressure atmosphere.

5,814,195

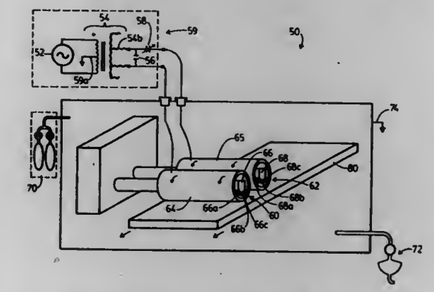
SPUTTERING SYSTEM USING CYLINDRICAL ROTATING MAGNETRON ELECTRONICALLY POWERED USING ALTERNATING CURRENT

John Lehan, Benecia; Henry Byorum, Sunnyvale; Russell J. Hill, El Cerrito, and J. Kirkwood Rough, San Jose, all of Calif., assignors to The Boc Group, Inc., Murray Hill, N.J.

Continuation of Ser. No. 428,896, Apr. 25, 1995, abandoned. This application Oct. 25, 1996, Ser. No. 736,978

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.12 **24 Claims**



1. A sputtering system for forming a dielectric layer on a substrate comprising:

an alternating current power supply having a first and a second pole that alternate in polarity;

a chamber;

a rotatable magnetron in said chamber, said rotatable magnetron including a cylindrical tubular target of electrically conductive material responsive to the power signal at the first pole of the alternating current power supply and a magnet assembly adapted to direct the plasma to form an erosion zone on the cylindrical tubular target, the erosion zone being the area sputtered when the negative portion of the power supply is supplied to the cylindrical tubular target, wherein the cylindrical tubular target is adapted to rotate such that the erosion zone is located at different parts of the cylindrical target as the cylindrical target rotates and so that the sputtering of the target removes some dielectric material deposited onto the target to form a cleaned portion of the target and wherein the removal of the dielectric from the cleaned portion of the target in portions away from the erosion zone reduces the impedance of the target as seen by the electrodes in the plasma when the positive portion of the power supply is supplied to the cylindrical tubular target and thus may prevent arcing, and

an electrically conductive member in the chamber responsive to the power signal at the second pole of the alternating current supply.

5,814,196

APPARATUS AND METHOD FOR HIGH THROUGHT SPUTTERING

Dennis R. Hollars, Los Gatos; Delbert F. Waltrip, San Jose; Robert B. Zubeck, Los Altos; Josef Bonigut, Alamo; Robert M. Smith, Antioch, and Gary L. Payne, Sunnyvale, all of Calif., assignors to Conner Peripherals, Inc., San Jose, Calif.

Division of Ser. No. 681,866, Apr. 4, 1991, abandoned. This application Apr. 8, 1993, Ser. No. 46,215

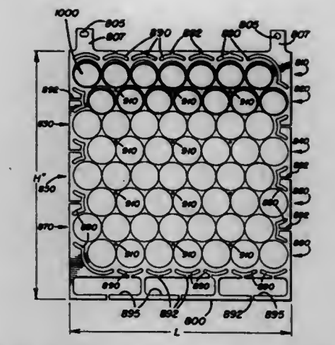
Int. Cl.[6] C23C *14/00*

U.S. Cl. 204—298.15 **11 Claims**

1. A sputtering apparatus for providing a single or multi-layer coating to the surface of a plurality of substrates, said apparatus comprising:

a plurality of chambers;

an input end and an output end; and



a plurality of pallets for carrying substrates of said plurality of substrates from said input end to said output end, said pallet including:

a plurality of notches extending inward from edges of the pallet;

a plurality of slots including arcuate sections concentric with the substrate-carrying region to which it is closest; and

at least one cavity near at least one edge portion of the pallet;

said plurality of notches, said plurality of slots, and said at least one cavity provided for preventing warping of said pallet across a width of said pallet and along a length of said pallet by providing a space into which said pallet may expand upon an increase in pallet temperature.

5,814,197

ELECTRODIALYSIS INCLUDING FILLED CELL ELECTRODIALYSIS (ELECTRODEIONIZATION)

Bruce T. Batchelder, North Reading; Irving D. Elyanow, Lexington; Arthur L. Goldstein, Weston; Russell J. MacDonald, Wilmington, all of Mass.; Wayne A. McRae, Mannedorf, Switzerland; Keith J. Sims, Wayland, and Li Zhang, Acton, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Division of Ser. No. 571,403, Dec. 13, 1995, Pat. No. 5,679,228, which is a division of Ser. No. 230,092, Apr. 25, 1994, Pat. No. 5,503,729. This application Dec. 16, 1996, Ser. No. 767,079

Int. Cl.[6] B01D *61/48*

U.S. Cl. 204—524 **7 Claims**

1. A process for removing ash from milk or liquid milk product, each having a colloidal portion, comprising passing said milk or liquid milk product through diluting compartments of an electrodialysis stack, at least said diluting compartments of said stack containing ion exchange granules, and passing direct electric current through said stack.

5,814,198

ELECTROLYTIC MAGNETIZATION DEVICE

Wen-Shing Shyu, 58, Ma Yuan West St., Taichung, Taiwan

Filed May 11, 1997, Ser. No. 896,263

Int. Cl.[6] C02F *1/46;* **C25B** *9/00;11/02*

U.S. Cl. 204—260 **1 Claim**

1. An electrolytic magnetization device comprises:

an outer pipe, an anode tube, a diaphragm, a cathode tube, an insulating tube, and a water flow controller,

a cover and a base seat covering an upper end of the outer pipe and a lower end of the outer pipe respectively,

the cover having a water outlet,

the base seat having a through hole and a water inlet,

the anode tube disposed in the outer pipe,

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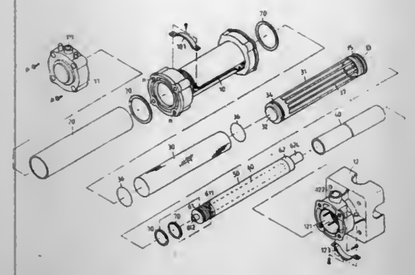
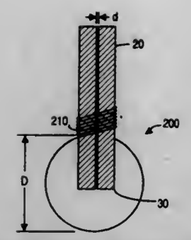


the diaphragm disposed in the anode tube,
a hollow pipe **31** disposed in the diaphragm,
the insulating tube disposed in the hollow pipe,
the outer pipe having a plurality of threaded holes to receive a plurality of corresponding screws respectively to fasten the cover and the outer pipe together,
the water flow controller having an inlet joint connected to the water inlet, a main body disposed beneath the inlet joint, a flow control post having a water passage disposed in the inlet joint, a water pressure stabilizer connected to the main body, an automatic switch device connected to the main body, a water drain device connected to the main body, a first outlet joint connected to the water drain device, and a second outlet joint connected to the main body,
the water drain device having a water outlet, a hollow interior to receive a ball and a plurality of O-rings disposed on the water drain device,
the automatic switch device having a switch seat,
a washer, a metal disk and a cushion disposed in the switch seat,
a micromotion switch disposed on the switch seat, and the micromotion switch contacting the metal disk slightly,
an O-ring enclosing the anode tube,
an end disk and a distal groove disposed on one end of the hollow pipe,
an opening and a distal recess formed on another end of the hollow pipe,
a first string inserted in the distal groove,
a second string inserted in the distal recess,
the hollow pipe having a plurality of ribs,
the insulating tube having a plurality of rabbets, axle holes, positioning holes and recesses,
an axle inserted through the corresponding axle holes,
each of the recesses receiving a yoke shaped metal plate,
each yoke shaped metal plate receiving two magnets, the axle having a center hole,
a plug having a first hole **611** and disposed at one end of the axle,
an end cover disposed at another end of the axle,
the end cover having a hollow post, a second hole, a plurality of cage recesses, and a groove,
a plurality of O-rings enclosing the plug, and the hollow post inserted in the through hole.

5,814,199
FORMING THIN FILM INTERFACED SAMPLES FOR ANALYSIS WITH CAPILLARY SEPARATION SYSTEMS
Purnendu K. Dasgupta, Lubbock, Tex., assignor to Texas Tech University, Lubbock, Tex.
Filed Sep. 20, 1996, Ser. No. 717,550
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—453 **16 Claims**

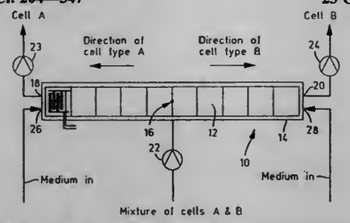
1. A method for introducing an analyte in a solution into the input end of a separation capillary in a capillary separation system for electric-field separation of said analyte from another substance in said solution, the method comprising the following sequential steps:



(a) providing a microreservoir by forming a loop having a transverse dimension and defining a plane substantially parallel to a longitudinal axis of said separation capillary, said loop being formed adjacent said input end of said separation capillary; and
(b) contacting said loop with said solution to form a sample of said solution containing said analyte as a film across an area defined by said loop such that at least a portion of said sample is in fluid communication with said input end of said separation capillary.

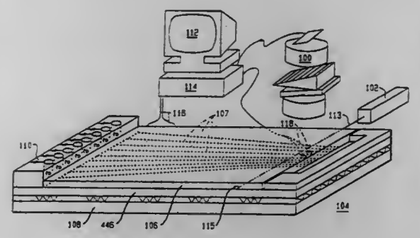
7. For use with a capillary separation system in which an analyte in a medium is to be separated from another substance in said medium for measurement, a capillary-microreservoir sampling unit, comprising:
a separation capillary having an input end into which said analyte in said solution is to be introduced; and
a microreservoir comprising a loop having a transverse dimension and defining a plane substantially parallel to a longitudinal axis of said separation capillary adjacent said input end, said loop being disposed adjacent said input end of said separation capillary;
said loop defining an area across which a sample comprising a film of liquid may be formed by contacting said liquid with said loop.

5,814,200
APPARATUS FOR SEPARATING BY DIELECTROPHORESIS
Ronald Pethig, and Gerardus Hendricus Markx, both of Gwynedd, Wales, assignors to British Technology Group Limited, London, England
PCT No. PCT/GB94/00702, § 371 Date Sep. 26, 1995, § 102(e) Date Sep. 26, 1995, PCT Pub. No. WO94/22582, PCT Pub. Date Oct. 13, 1994
PCT Filed Mar. 31, 1994, Ser. No. 530,131
Int. Cl.[6] G01N *27/26;27/447;27/453*
U.S. Cl. 204—547 **23 Claims**



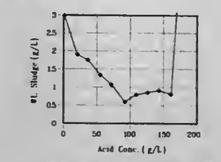
17. A method for selectively separating first type particles from second type particles, said method comprising:
flowing a fluid containing said first type particles and said second type particles into a chamber formed by a housing, said chamber having a first and a second electrode array disposed therein, said housing forming a first inlet, a second inlet, a third inlet, a first outlet, and a second outlet, said fluid flowing into said chamber through said first inlet;
activating a power source to establish a dielectrophoretic field between said first electrode array and said second electrode array to cause a first resultant force to be experienced by said first type particles and flowing a second fluid, containing none of said first type and said second type particles, through said second inlet to cause said second type particles to move in a first direction, said second fluid exiting said chamber through said first outlet;
deactivating said power source and flowing said second fluid through said third inlet to cause said first type particles and said second type particles to move in said second direction, said second direction being in a direction opposite to said first direction, said second fluid exiting said chamber through said second outlet; and
reapplying said power source to reestablish said dielectrophoretic field between said first electrode array and said second electrode array; and flowing said second fluid through said second inlet to cause said second type particles to move in said first direction, said second fluid exiting said chamber through said first outlet.

5,814,201
APPARATUS AND METHOD FOR THE GENERATION, SEPARATION, DETECTION, AND RECOGNITION OF BIOPOLYMER FRAGMENTS
John W. Simpson, Branford; Jonathan Marc Rothberg, Guilford, and Gregory T. Went, Madison, all of Conn., assignors to CuraGen Corporation, New Haven, Conn.
Filed May 9, 1995, Ser. No. 438,231
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—612 **80 Claims**

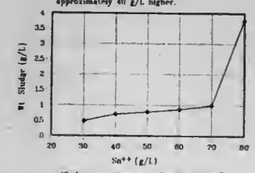


1. An integrated apparatus for concurrent separation and analysis of a plurality of biopolymer fragment samples, each sample comprising a plurality of fragments obtained from one or more biopolymers, the apparatus comprising:
(a) means for loading the plurality of biopolymer fragment samples into an electrophoretic separation medium;
(b) means for substantially concurrent electrophoretic separation of each of the plurality of biopolymer fragment samples loaded into the electrophoretic separation medium;
(c) means for substantially simultaneously stimulating light emissions from fragments in a plurality of biopolymer fragment samples; and
(d) means for substantially simultaneous resolution of said light emissions into spatial and spectral components and generation of output signals representative thereof, said means for substantially simultaneous resolution being a transmission imaging spectrograph comprising
(i) an optic assembly positioned to receive a substantial fraction of the plurality of light emissions for simultaneous spatial imaging along a first axis and spectral dispersion along a second axis, and
(ii) a detector array for simultaneous spatial and spectral detection of the plurality of light emissions imaged along the first axis and dispersed along the second axis by the optic assembly, the detector producing output signals representative of the detected light.

5,814,202
ELECTROLYTIC TIN PLATING PROCESS WITH REDUCED SLUDGE PRODUCTION
Ersan Ilgar, Monroeville, Pa., assignor to USX Corporation, Pittsburgh, Pa.
Filed Oct. 14, 1997, Ser. No. 950,351
Int. Cl.[6] C25D *5/04*
U.S. Cl. 205—140 **15 Claims**



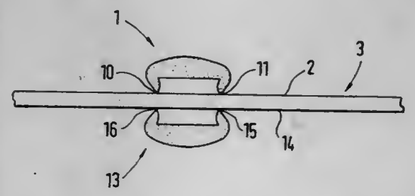
Sludge generation as a function of H_2SO_4 concentration at 80 g/L Sn^{2+} and 110°F. Acid concentrations are given in terms of acid added to solution, the measured concentration was approximately 40 g/L higher.



Sludge generation as a function of Sn^{2+} concentration at 128 g/L H_2SO_4 (as added) and 110°F

12. Method of continuously tin plating steel strip while suppressing the generation of sludge having stannic hydroxides as a major component comprising continuously passing said steel strip through an aqueous electrolytic bath at a speed of 900–1600 ft/min while imposing on said aqueous electrolytic bath an electric current at a current density of 900–1500 amperes per square foot of steel strip, said bath comprising 90–160 g/L sulfuric acid and 40–70 g/L Sn^{++} from a source including less than 1% hydroxides of tin, and while maintaining the pH of said bath no higher than 0.5 and its temperature between 90°–130° F.

5,814,203
PROCESS TO DECREASE THE STRENGTH OF AN ELECTRIC FIELD PRODUCED BY A HIGH VOLTAGE CONDUCTIVE PATH OF A PRINTED CIRCUIT BOARD AND PRINTED CIRCUIT ASSEMBLY USING SAME
Pascal Gaston Raymond Delporte, Pont-á-Celles, and Pierre Paul Roger Willy Depireux, Charleroi, both of Belgium, assignors to Alcatel N.V., Netherlands
Filed Nov. 28, 1995, Ser. No. 563,622
Claims priority, application European Pat. Off., Dec. 12, 1994, 94203604
Int. Cl.[6] C25D *5/50*
U.S. Cl. 205—226 **8 Claims**



1. A process to electrochemically apply electrically conductive coating material (**4**) to a conductive path (**1**) on an upper surface

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(2) of a printed circuit board (3) to decrease the strength of an electric field produced around the conductive path (1) on the upper surface (2) of the printed circuit board (3) when a voltage is applied to the conductive path (1), said conductive path having a substantially rectangular shaped cross-section with an upper side (5), upper edges (8, 9), lateral sides (6, 7), lower edges (10, 11) and a lower side (12), said lower side and lower edges being located against said upper surface of said printed circuit board, and said process including the steps of:

electrochemically coating said upper side (5) of said conductive path with a layer of electrically conductive coating material (4); and

reflowing said coating material to cover said upper edges and said lateral sides of said conductive path,

wherein said coating step consists of depositing a layer of said coating material (4) of a thickness at least approximately twice as thick as that of a conventional layer of approximately 12 μm on said upper side (5) of said conductive path (1) such that, after said reflowing step, said upper edges (8, 9) are covered with the layer of said reflowed coating material; so that when a voltage is applied to the conductive path (1), the strength of the electric field produced around the conductive path is decreased compared to the strength of the electric field around the conductive path that would be produced by the same voltage if the layer of coating material was not as thick.

5,814,204

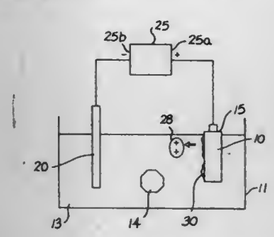
ELECTROLYTIC DECONTAMINATION PROCESSES

Thomas F. D'Muhala, Raleigh, N.C., assignor to Corpex Technologies, Inc., Morrisville, N.C.

Filed Oct. 11, 1996, Ser. No. 730,492

Int. Cl.[6] C25F *1/00*

U.S. Cl. 205—705 **11 Claims**



1. A process of decontaminating by electrochemical attack, a metal workpiece contaminated with one or more metal oxides, the process comprising the steps of:

(a) placing the metal workpiece contaminated with one or more metal oxides, in a solution including hydrazide ions to complex metal ions of the metal oxides with hydrazide ions, and connecting the metal workpiece to a positive terminal of means for providing direct current;

(b) placing a cathode in the solution including metal ions complexed with hydrazide ions and connecting the cathode to a negative terminal of means for providing direct current;

(c) conducting current from the metal workpiece through the solution including metal ions complexed with hydrazide ions to the cathode; and

(d) plating out the metal ion as a metal at the cathode thereby removing the metal oxides from the metal workpiece.

5,814,205

DETECTION OF LEAD IN BLOOD

Jerome Francis McAleer; Martin Robert Ackland, both of Wantage; Elliot Verne Plotkin, Inverness, and Lucinda Cordeiro, Bray-on-Thames, all of United Kingdom, assignors to Palintest Limited, Tyne & Wear, United Kingdom

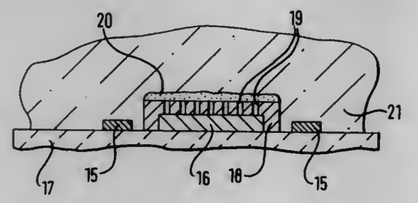
PCT No. PCT/GB95/00269, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996, PCT Pub. No. WO95/22052, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 10, 1995, Ser. No. 693,210

Claims priority, application United Kingdom, Feb. 11, 1994, 9402661

Int. Cl.[6] G01N *27/26*

U.S. Cl. 205—789 **20 Claims**



1. A device for measuring the quantity of ions of a heavy metallic element which are present in a solution, the device comprising a mercury-free, carbon electrode to the surface of which a layer of silver is applied, said electrode being separated from the solution by means, comprising a layer of material, for preventing passage of macromolecules and other contaminants which would otherwise tend to foul the electrode, but permitting passage therethrough of the ions to be measured.

7. A method for determining the quantity of ions of a heavy metallic element which are present in a solution, comprising the steps of contacting said solution with the layer of material for preventing passage of macromolecules and other contaminants overlaying the mercury-free carbon electrode of a device according to claim 1, and determining the number of said ions coming into contact with said electrode by a voltametric method.

5,814,206

PASSIVE ACID TAR NEUTRALIZATION PROCESS

Jeffery P. Bauman, Lewisville, and Richard W. McManus, Copper Canyon, both of Tex., assignors to Sound-epic Environmental Services, Carrollton, Tex.

Continuation of Ser. No. 569,752, Dec. 8, 1995, abandoned. This application Dec. 23, 1996, Ser. No. 771,881

Int. Cl.[6] C10G *17/00*

U.S. Cl. 208—13 **9 Claims**

1. A process for in situ neutralization of acid tar without actively mixing the tar comprising the steps of:

covering a deposit of acid tar with a layer of coarse grade neutralizing agent having a specific gravity in excess of that of the deposit and a particle size greater than about ⅛ inch, depth of the layer being selected to provide sufficient neutralizing capacity to neutralize at least the entire deposit;

waiting sufficient time for the layer of neutralizing agent to sink completely into the deposit of tar; and

neutralizing the deposit without actively mixing the neutralizing agent and the deposit as the neutralizing agent sinks into the deposit.

5,814,207

OIL RE-REFINING METHOD AND APPARATUS

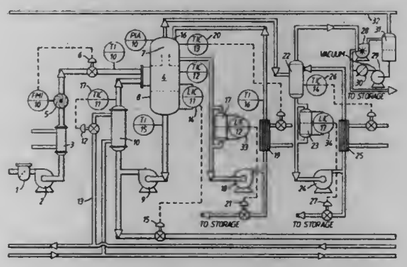
Kalevi John Kenton, London, United Kingdom, assignor to Enprotec International Group N.V., Bulle, Switzerland

Filed Jun. 7, 1996, Ser. No. 664,232

Claims priority, application United Kingdom, Jun. 8, 1995, 9511616

Int. Cl.[6] C10M *175/00;* **B01D** *1/00;1/14*

U.S. Cl. 208—184 **12 Claims**



1. A method of re-refining used oil wherein the used oil is processed in at least one cyclonic vacuum evaporator comprising a substantially void evaporation chamber into which feedstock is substantially tangentially injected, and wherein a fraction of the feedstock is condensed in a spray condenser communicating with the evaporation chamber.

5,814,208

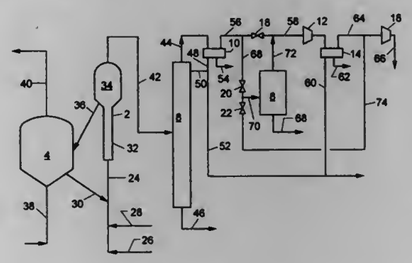
HYDROCARBON CATALYTIC CRACKING PROCESS

Raghu K. Menon, 124 Bracken Rd., Medford, N.J. 08055, and Ramakrishnan Ramachandran, 232 Hillside Ave., Allendale, N.J. 07401

Continuation of Ser. No. 315,633, Sep. 30, 1994, abandoned. This application Aug. 8, 1996, Ser. No. 694,227

Int. Cl.[6] C10G *11/18*

U.S. Cl. 208—113 **15 Claims**



1. In a process for producing and recovering cracked hydrocarbons from a hydrocarbon feedstock in a hydrocarbon fluid catalytic cracking system comprising a hydrocarbon cracking zone, a catalyst regeneration zone and a cracked hydrocarbon distillation zone comprising the steps:

(a) cracking said hydrocarbon feedstock in said hydrocarbon cracking zone in the presence of hot regenerated hydrocarbon cracking catalyst, and removing a cracked hydrocarbon product stream and coke-coated catalyst from said cracking zone;

(b) transporting said coke-coated catalyst to said catalyst regeneration zone and regenerating said catalyst therein by burning coke from the catalyst in the presence of an oxygen-inert gas mixture, and returning regenerated catalyst to said hydrocarbon cracking zone;

(c) distilling said cracked hydrocarbon product in said cracked hydrocarbon distillation zone, thereby producing an overhead gas stream and one or more liquid streams;

(d) cooling said overhead gas stream, thereby separating said gas stream into a liquid stream containing C_5 and heavier hydrocarbons and a wet gas stream comprised of C_4 and lighter hydrocarbons and hydrogen; and

(e) compressing said wet gas stream in a wet gas compressor; the improvement comprising enhancing the rate of conversion of hydrocarbon to cracked hydrocarbon product by, prior to step (e),

(f) subjecting at least part of said wet gas stream to a pressure swing adsorption process in an adsorption zone containing an adsorbent which preferentially adsorbs C_2 and, higher hydrocarbons from said wet gas, thereby producing a nonadsorbed gas fraction comprised of methane and hydrogen and a desorbed gas fraction comprised of C_2 and higher hydrocarbons; and

(g) transporting at least part of said desorbed gas fraction to said wet gas compressor;

thereby reducing the pressure throughout said fluid catalytic cracking system and consequently increasing the flow of oxygen-containing gas to said catalyst regeneration zone and enhancing the extent of catalyst regeneration.

5,814,209

METHOD FOR ECOLOGICAL UTILIZATION OF ACID EFFLUENTS OF FULLER'S EARTH

Reinhard Hähn; Klaus Schurz, both of Munich; Hans Buckl, Freising, and Wolfgang Eisenschmid, Au Hallertau, all of Germany, assignors to Sud-Chemie AG, Germany

Filed Oct. 2, 1994, Ser. No. 333,222

Claims priority, application Germany, Mar. 3, 1993, 43 06 663.1

Int. Cl.[6] C10G *25/06*

U.S. Cl. 208—299 **20 Claims**

1. A method for the production of a sorption agent comprising

gathering acid effluents from the production of Fuller's earth, wherein the acid effluents contain as constituents $Fe^{2+/3+}$-, Al^{3+}-, Ca^{2+}-, and Mg^{2+} cations, as well as inorganic anions,

reacting the acid effluents with an alkaline silicate solution at a temperature of about 60°–80° C. to produce a precipitate, and

separating the resulting precipitate from the aqueous phase to produce the sorption agent, wherein said sorption agent has an ion exchange capacity of at least 20 to about 190 meq/100 g.

14. The sorption agent produced by the method of claim 1 which has the following characteristics:

(a) a specific surface area of about 100 to 600 m^2/g;

(b) a micropore volume of about

0 to 14 nm: 0.2 to 0.7 ml/g

0 to 25 nm: 0.2 to 0.8 ml/g

0 to 80 nm: 0.2 to 0.9 ml/g; and

(c) an ion exchange capacity (IEC) of about 20 to 190 meq/100 g.

18. A process for the removal of color from oils and the removal of soaps, phospholipids and metallic ions from oils by use of a sorption agent comprising

(a) preparing the sorption agent by the process of claim 1, and

(b) Contacting the oils with the sorption agent to remove color, and soaps, phospholipids and metallic ions.

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5,814,210

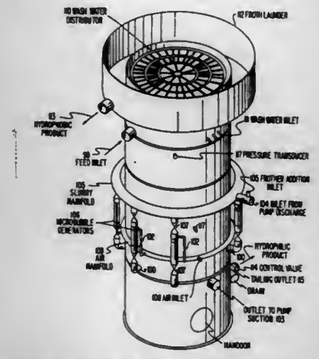
APPARATUS AND PROCESS FOR THE SEPARATION OF HYDROPHOBIC AND HYDROPHILIC PARTICLES USING MICROBUBBLE COLUMN FLOTATION TOGETHER WITH A PROCESS AND APPARATUS FOR GENERATION OF MICROBUBBLES

Roe-Hoan Yoon; Gregory T. Adel, and Gerald H. Luttrell, all of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation of Ser. No. 354,830, Dec. 8, 1994, abandoned, which is a continuation of Ser. No. 982,890, Nov. 30, 1992, Pat. No. 5,397,001, which is a division of Ser. No. 574,794, Aug. 30, 1990, Pat. No. 5,167,798, which is a continuation-in-part of Ser. No. 148,871, Jan. 27, 1988, Pat. No. 4,981,582. This application Apr. 30, 1996, Ser. No. 641,778

Int. Cl.[6] B03D *1/02;1/24*

U.S. Cl. 209—164 **13 Claims**



11. A microbubble froth flotation apparatus, comprising:

a source of a mixture of particles containing both hydrophobic and hydrophilic constituents;

a gas source;

means for combining a gas from said gas source with said mixture of particles from said source of said mixture of particles which will adhere to said hydrophobic particles in said mixture of particles, said means for combining producing a gas combination including said gas and said mixture of particles;

a plurality of microbubble generators each comprising

(I) a conduit having a longitudinal axis, an entrance and an exit, and

(II) stationary means for changing a direction of flow of said gas combination positioned inside said conduit to change said direction of flow a plurality of times as said gas combination traverses said conduit from said entrance to said exit, said means for changing said direction of flow of said gas combination dividing said gas in said gas combination into microbubbles where a majority of said microbubbles have a diameter of less than 400 microns, wherein said stationary means is selected from the group consisting of (i) a plurality of shear elements of uniform thickness with each shear element formed from a sheet member having a substantially straight edge that twists 90° to another opposite straight edge being at right angles to another of said shear elements where the twist is 90° in the opposite direction whereby each said element is capable of dividing said gas combination in half and twisting said gas combination first in one direction by 90° where said gas combination is next divided again in half and twisted by 90° in the opposite direction followed by the next said element dividing the gas combination in half and twisting said gas combination in the opposite direction by 90° and so continued until said gas combination traverses said conduit from said entrance to said exit and (ii) a pair of substantially identical vanes each having a sinuous cross section extending between said conduit entrance and said conduit exit where said vanes are axially staggered and in engagement with each other generally along said longitudinal axis of said conduit with connection being made between points of engagement whereby said vanes substantially close the conduit when viewed in the direction of said longitudinal axis;

said microbubble generators each producing an aerated mixture within said conduit which contains microbubbles, hydrophobic particles, and hydrophilic particles wherein at least a portion of said hydrophobic particles are adhered to said microbubbles;

a flotation tank positioned to receive said aerated mixture from said microbubble generators;

means for recovering hydrophobic particles from said a first region of said flotation tank; and

means for recovering hydrophilic particles from a second region of said flotation tank.

5,814,211

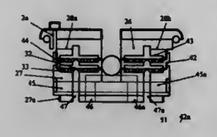
REUSABLE SPIN-ON MULTI SYSTEM OIL FILTER

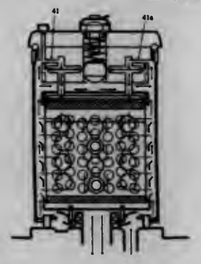
Ano Leo, 229 Sanstone Dr. N.W., Calgary, AB., Canada, T3K 3B9

Filed May 23, 1996, Ser. No. 652,355

Int. Cl.[6] B01D *35/06;35/147*

U.S. Cl. 210—90 **12 Claims**





1. A reusable oil filter, comprising:

a hollow container having opposed ends;

a plurality of spaced apart concentric filtration members removably mounted in concentric relation within said container, each member having a different porosity for providing a plurality of successive filtering steps;

removable filter head means releasably mounted to one end of said container for sealing said one end of said opposed ends, said filter head including upper and lower filter body members, an underlay sheet element and at least two oil flow holes; and

filter base means removably mounted to said container, said filter base means having an inlet to receive oil to be filtered and an outlet to discharge filter oil.

5,814,212

MONITORING PROCESS AND DEVICE FOR AN ACTIVATED CARBON FILTRATION SYSTEM OF DRINKING WATER

Chao Fou Hsu, 109, Lane 316, Dah Shuenn 3th Rd., Kaohsiung, Taiwan

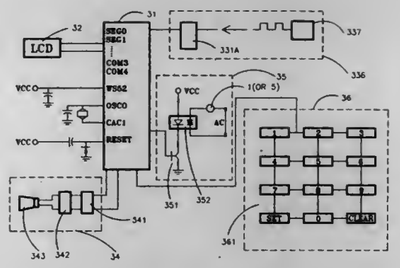
Filed Mar. 11, 1996, Ser. No. 613,845

Int. Cl.[6] B01D *17/12*

U.S. Cl. 210—87 **2 Claims**

1. An activated carbon filtration system for filtering drinking water having at least an activated carbon filter, and including a monitoring device comprising:

a microprocessor operable for storing at least a total water making volume value of said activated carbon filter as a



predetermined reference value, that is a total volume of drinking water that said activated carbon filter is manufactured to produce before said activated carbon filter becomes ineffective;

a LCD indicator circuitry which is electrically connected to said microprocessor and operable for notifying an user of a timing to replace said activated carbon filter and indicating a plurality of operational condition data sent from said microprocessor, said operational condition data including a current time, a recorded time showing when a previous replacement of said activated carbon filter was made, a current water making volume value that shows a current total volume of drinking water produced by said activated carbon filter, said total water making volume value, and a mechanical breakdown condition that illustrates whether said activated carbon filtration system is mechanically out of order;

a warning means, which is electrically connected to said microprocessor, for advancing a warning information signal to notify said user of said timing to replace said activated carbon filter, said warning means comprising a sound generating circuitry which comprises a sound circuit, a speaker driving circuit and a speaker all electrically connected, said sound circuit storing a sound track, said speaker driving circuit broadcasting said stored sound track as said warning information signal via said speaker;

a detecting means comprising at least an activated carbon filter detecting circuitry which is electrically connected to said microprocessor for monitoring a functional condition of said activated carbon filter by detecting the quantity of drinking water produced by said activated carbon filter by means of a water flowmeter, wherein said water flowmeter is installed in a water outlet of said activated carbon filter for determining said functional condition of said activated carbon filter by transmitting a series of pulse waves to a calculator to compute an amount of said drinking water flowing out from said activated carbon filter, wherein said calculator receives and accumulates said pulse waves to achieve said current water making volume value that is a current volume of drinking water made by said activated carbon filter as a condition detecting value, wherein when said condition detecting value exceeds said predetermined reference value, a digital signal is sent from said activated carbon filter detecting circuitry to said microprocessor to activate said microprocessor to send out an activating signal to said sound generating circuitry to generate said sound information signal to notify said user to replace said activated carbon filter;

an electromagnetic gate installed to a water passage connecting to said activated carbon filter;

a power switching means which is electrically connected to said microprocessor comprising a transistor and a photoelectric driving power transistor all electrically connected, wherein when said warning means is activated to generate said warning information signal for a predetermined period of time, an activated signal is sent from said microprocessor to said power switching means to activate said transistor to conduct electricity, so that said photoelectric driving power transistor activates said electromagnetic gate to shut off said water passage connecting to said activated carbon filter for ceasing a water supply of said activated carbon filtration system; and

an information input circuitry which is electrically connected to said microprocessor for keying in said total water making volume value of said activated carbon filter into said microprocessor, said information input circuitry comprising an input keyboard which has a plurality of numeral keys from 0 to 9, a "SET" key and a "CLEAR" key, wherein said total water making volume value of said activated carbon filter is keyed in by pressing said numeral keys, saved by pressing said "SET" key and deleted by pressing said "CLEAR" key.

5,814,213

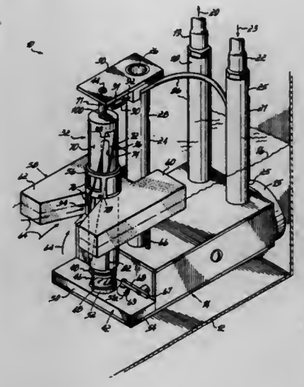
SKIMMING APPARATUS

James A. Glasgow, 7481 N. Timberline Dr., Cincinnati, Ohio 45243

Filed Nov. 10, 1997, Ser. No. 967,574

Int. Cl.[6] B01D *21/24*

U.S. Cl. 210—104 **17 Claims**



1. A skimming apparatus for skimming liquid adjacent the surface of a volume of liquid contained in a tank, the apparatus comprising:

a substantially enclosed housing having an exterior and an interior and adapted to be mounted within the tank at a vertical position below a normal operating level for the liquid in the tank;

an outlet tube secured to the housing and having a bottom end extending into the housing, the outlet tube adapted to convey liquid outwardly from the housing via the bottom end;

an intake tube secured to the housing so as to be rotatable with respect thereto, the intake tube having a lower end in fluid communication with the interior of the housing and an upper end extending above the housing, the intake tube further having an elongated slot extending substantially along the length thereof;

an outer sleeve telescopingly received over the intake tube, the outer sleeve having an outer opening at least partially aligned with the slot, whereby aligned portions of the opening and the slot define an inlet for liquid in the tank to flow into the intake tube and then to the interior of the housing;

a first float disposed within the interior of the housing and vertically movable depending on the liquid level therein, the float being operatively connected to the intake tube such that vertical movement of the float causes rotational movement of the intake tube with respect to the outer sleeve thereby varying the size of the inlet; and

a flexible joint connecting the lower end of the intake tube to the housing, the joint permitting rotation of the intake tube with respect to the housing while maintaining a substantially fluid tight connection therebetween.

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5,814,214

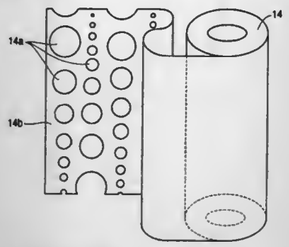
ELECTRONICALLY DETECTABLE COMPOUND OIL FILTER AND ITS DEVICE

Myung Woo Chun, No. 604 Shibuya Sanshin Mansion, 29-33, Sakuraoka-Cho, Shibuya-ku, 150, Tokyo, Japan

Filed Jun. 29, 1995, Ser. No. 496,910

Int. Cl.[6] B01D *35/147*

U.S. Cl. 210—130 **8 Claims**



1. An oil filter comprising:

an outer casing having an oil inlet and an oil outlet;

filtering means disposed in said outer casing comprising a sheet member with holes of various sizes therein, wherein said holes are arranged in columns and, within each said column, said holes either progressively increase or decrease in size;

bypass means between said oil inlet and said oil outlet for selectively allowing a bypass flow of oil to flow from said oil inlet to said oil outlet without flowing through said filtering means; and

means responsive to a pressure of an intake flow of oil for controlling said bypass means;

wherein said intake flow of oil, during filtering, is parallel to a filtering surface of said filtering means.

5,814,215

OIL FILTER INCLUDING AN INTEGRAL FILTER SUPPORT AND HOUSING DRAIN VALVE ASSEMBLY

Elke Bruss, Asperg; Hans Jensen, Kirchheim/Teck, and Rolf Möhle, Bretzfeld, all of Germany, assignors to Knecht Filterwerke GmbH, Stuttgart, Germany

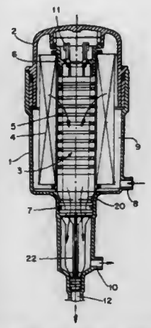
PCT No. PCT/DE96/01027, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO97/00112, PCT Pub. Date Jan. 3, 1997

PCT Filed Jun. 12, 1996, Ser. No. 776,866

Claims priority, application Germany, Jun. 17, 1995, 195 22 023.4

Int. Cl.[6] B01D *35/34*

U.S. Cl. 210—130 **10 Claims**



1. A lubricating oil filter for internal combustion engines comprising:

a filter housing cup including an open top, a sidewall, a bottom wall, an inlet adjacent said bottom wall, an outlet tube extending from said bottom wall, said outlet tube having an interior surface and first and second outlet ports, wherein said first outlet port is located at a lower end of said outlet tube and said second outlet port is positioned above said first outlet port;

a screw cover for closing the open top of said filter housing cup;

a filter support disposed within said filter housing cup, the filter support having a first end that is rotatably connected to said screw cover by a connecting means and a second end including a valve member that sealingly engages said first outlet port when said cover fully closes the open top of said filter housing, wherein said filter support includes a tubular upper imperforate section adjacent said cover and a tubular lower imperforate section that removably and sealingly engages an upper portion of the interior surface of said outlet tube at a location above said first and second outlet ports, said filter support including a first radially permeable section disposed between the tubular upper and lower imperforate sections of said filter support, said filter support including a second radially permeable section disposed on said tubular lower imperforate section and connected to the valve member for permitting flow from an interior of said tubular perforated section to said second outlet port via said lower tubular imperforate section, wherein said tubular upper and lower imperforate sections and said first and second radially permeable sections and said valve member are integrally connected together so that said filter support can be removed from said housing cup as an integral unit;

filtering means surrounding the first radially permeable section of said support tube, means for removably sealing an upper end of the filtering means to said tubular upper imperforate portion of the support tube, and means for removably sealing a lower end of said filtering means to the tubular lower imperforate portion of said support tube;

whereby said screw cover and said filter support including said valve member can be removed from said filter housing cup as an integral unit, and whereby removal of said integral unit from said filter housing cup removes said valve member from said first outlet port to permit oil to drain from said filter housing via said first outlet port.

5,814,216

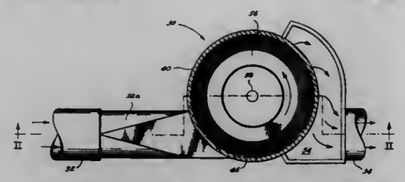
WASTE WATER CONTAMINANT SEGREGATING UNIT FOR SEWER CONDUITS

Gilles Filion, Kirkland, Canada, assignor to John Meunier Inc., Montreal, Canada

Filed Feb. 7, 1997, Ser. No. 797,223

Int. Cl.[6] E03F *5/14;5/10;* **B01D** *36/04*

U.S. Cl. 210—154 **20 Claims**



1. A screening apparatus to be serially mounted to a sewer conduit so as to be adapted to link a high-output waste water inlet pipe to a low-output refuse pipe and to an outlet pipe, the outlet pipe destined to become operational once the low-output refuse pipe overflows under storm water conditions, said screening apparatus comprising:

a) a main cylindrical chamber defining a flooring, a top wall and a cylindrical peripheral wall;

b) an annular grate coaxially located in said main chamber and fixedly attached to said peripheral wall at a position intermediate said flooring and said top wall, thus defining a lower portion under said grate and an upper portion over said grate in said main chamber, said grate being destined to screen rising water levels passing therethrough of any macroparticles contained in the water once the low-output refuse pipe is overloaded and water overflows under storm water conditions;

c) a main cylinder coaxially attached to said main chamber upper portion spacedly from said top wall; said main cylinder defining a cylindrical wall, a through channel therein, an upper edge facing said main chamber top wall and a lower edge opposite said upper edge, said annular grate being adjacent to and extending from said main cylinder lower edge radially outwardly to said main chamber peripheral wall;

d) an inlet opening, destined to be fluidingly connected to the waste water inlet pipe, said inlet opening being eccentrically located on said main chamber peripheral wall in said main chamber lower portion;

e) at least one first refuse outlet opening destined to be fluidingly connected to the refuse pipe, said first refuse outlet opening being located in said main chamber lower portion; and

f) an overflow outlet opening located on said main chamber peripheral wall, in said main chamber upper portion, and destined to be fluidingly connected to said outlet pipe.

5,814,217

MAGNETIC SEPARATOR FOR NEEDLE-SHAPED CHIPS

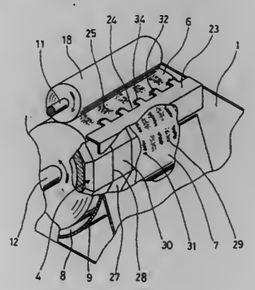
Minoru Yamazaki, Nagoya, and Hidenori Sano, Kariya, both of Japan, assignors to CNK Co., Ltd., Kariya, Japan

Filed Dec. 24, 1996, Ser. No. 773,771

Claims priority, application Japan, Jul. 23, 1996, 8-225792

Int. Cl.[6] B01D *35/06*

U.S. Cl. 210—222 **8 Claims**



1. A magnetic separator for separating chips made of a magnetic substance material from liquid with a sludge, comprising:

a transfer means for transferring said chips, which transfers said chips attracted on a transfer surface of said transfer means toward a predetermined transfer direction, wherein said transfer means comprises a nonmagnetic rotary cylinder made of nonmagnetic substance material,

a magnetic means for attracting said chips, which is disposed inside of said transfer means, has a N pole surface and a S pole surface disposed near said transfer surface of said transfer means and attracts said chips to said transfer surface of said transfer means,

a pressing means for pressing said chips, said pressing means having an elastical member, presses said chips attracted on said transfer surface of said transfer means and separates said chips from said liquid,

wherein said magnetic separator has a guide means which is disposed near said pressing means and faces said transfer surface of said transfer means with a predetermined distance in order to bring down said chips attracted and rising up near a central portion of said each pole surface of said magnet means before said chips are pressed by said pressing means.

5,814,218

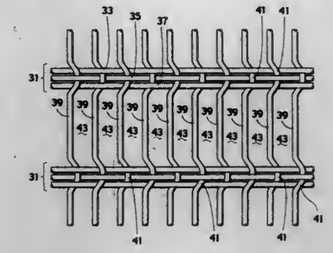
DISTORTED RECTANGULAR FILTER CLOTH SCREEN FOR VIBRATING SCREENING MACHINE

William S. Cagle, 7021 E. 77th Pl., Tulsa, Okla. 74133

Filed Jan. 16, 1996, Ser. No. 585,624

Int. Cl.[6] B01D *33/00;39/08;39/10;* **B07B** *1/46*

U.S. Cl. 210—388 **18 Claims**



1. A screen for use with a vibrating screening machine to filter undesired particles from a liquid comprising:

a filter cloth having a substantially rectangular mesh suitable for separating the undesired particles from the liquid;

a back-up having a mesh substantially coarser than said filter cloth mesh; and

means for bonding said filter cloth and said back-up in laminar relationship;

said substantially rectangular mesh comprising an array of parallel individual wires as lengths thereof and a transverse array of parallel groups of at least three wires as widths thereof, said individual wires of said substantially rectangular mesh when viewed in a direction perpendicular to a surface of said cloth being distorted from rectangular proximate ends of said lengths by bows in said individual wires extending through each of said parallel groups of wires.

5,814,219

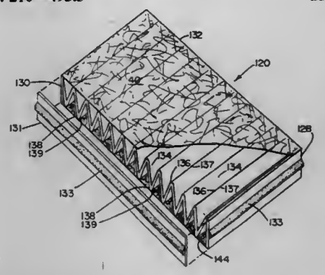
PLEATED FILTER HAVING A PLANAR SHEET OF RANDOMLY ARRANGED FILAMENTS TO MAINTAIN PLEAT SPACING

Francis A. Friedmann, South St. Paul; Wayne M. Wagner, Apple Valley, and Daniel T. Risch, Burnsville, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 426,222, Apr. 21, 1995, abandoned. This application Dec. 30, 1997, Ser. No. 694

Int. Cl.[6] B01D *27/06*

U.S. Cl. 210—493.3 **23 Claims**



9. A filter comprising:

a filter element having a succession of interconnected pleats, the pleats having successive inlet pleat tips and successive outlet pleat tips, the inlet pleat tips defining a generally planar inlet boundary of the filter element and the outlet pleat tips defining a generally planar outlet boundary of the filter element;

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a permeable generally inelastic first sheet covering the inlet boundary of the filter element, the first sheet extending across successive inlet pleat tips and being adhesively affixed to the inlet pleat tips for maintaining spacing of the pleats;

a permeable generally inelastic second sheet covering the outlet boundary of the filter element, the second sheet extending across successive outlet pleat tips and being adhesively affixed to the outlet pleat tips for maintaining spacing of the pleats; and

wherein each of the first and second sheets comprises a plurality of randomly arranged plastic filaments which are bonded to each other at junctions between the filaments and define a plurality of randomly spaced and shaped openings for allowing substantially unrestricted flow of a fluid through the first and second sheets, and each of the sheets has a Frazier air permeability greater than 500.

5,814,220

PROCESS FOR PRODUCING BLOOD SEPARATING AGENT

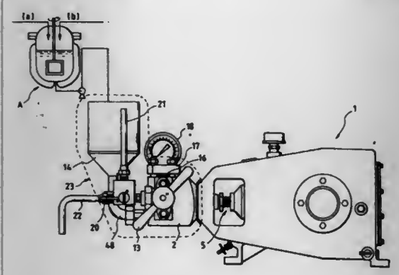
Hiroshi Mikami, Kanagawa; Kenshin Nakahara, Okayama; Mariko Kimura, Kanagawa, and Toshikazu Ishii, Tokyo, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 11, 1996, Ser. No. 763,755

Claims priority, application Japan, Dec. 20, 1995, 7-348586

Int. Cl.[6] B01J *13/00;* **B01D** *17/00*

U.S. Cl. 210—516 **8 Claims**



1. A process for producing a blood separating agent, which comprises:

supplying a mixture containing (a) a separation layer forming high molecular weight compound as a main component and (b) a thixotropy-providing agent selected from the group consisting of inorganic fine particles and organic gelling agents into a cylinder block of a homogenizer, wherein the homogenizer comprises (i) the cylinder block equipped with a plunger capable of performing reciprocating movement and (ii) a valve body which is connected to the cylinder block and equipped with a valve member, a valve sheet and an impact ring; and

applying a compressive shearing stress to the mixture in the homogenizer by forward movement of the plunger to force the mixture through a gap between the valve member and valve sheet, at such a temperature that viscosity of the mixture becomes 1×10^4 centipoises or less, thereby obtaining a blood separating agent in the form of a dispersion or a uniform gel;

wherein the homogenizer further comprises a heating element for heating both of the cylinder block and the valve body.

5,814,221

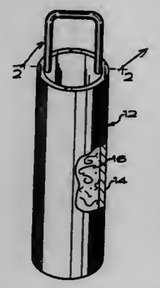
SOLUTION TREATMENT DEVICE

Raul Patino Cervantes, Louisville, Ky., assignor to Goldenrod, Inc., Louisville, Ky.

Continuation of Ser. No. 360,464, Mar. 13, 1995, Pat. No. 5,522,992, which is a continuation-in-part of Ser. No. 42,157, Apr. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 732,060, Jul. 18, 1991, abandoned. This application May 3, 1996, Ser. No. 642,466

Int. Cl.[6] C02F *1/00*

U.S. Cl. 210—542 **16 Claims**



1. A device for the treatment of a solution comprising:

a sealed container; and

a chemical treatment mixture disposed within said container, said mixture comprising at least magnetite and an organic compound selected from the group consisting of kerosene, mineral oil, petroleum naphtha, turpentine, V.M.&P naphtha and mixtures thereof.

5,814,222

OXYGEN ENRICHED LIQUIDS, METHOD AND APPARATUS FOR MAKING, AND APPLICATIONS THEREOF

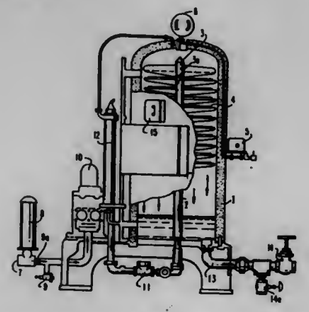
Zoltai Mária náe Zelenák, Budapest; László Berzsenyi, Érd, both of Hungary, and Frank Abramoff, Marina del Rey, Calif., assignors to Life International Products, Inc., Naples, Fla.

PCT No. PCT/US95/03889, § 371 Date May 1, 1995, § 102(e) Date May 1, 1995, PCT Pub. No. WO95/21930, PCT Pub. Date Nov. 2, 1995

PCT Filed Mar. 31, 1995, Ser. No. 411,708

Int. Cl.[6] C02F *3/10*

U.S. Cl. 210—615 **19 Claims**



1. A process for enriching a liquid with oxygen which comprises the steps of

(a) introducing a liquid and oxygen into a liquid and oxygen mixer and mixing the liquid with oxygen therein,

(b) introducing the liquid from step (a) into a sealed enriching vessel containing a plurality of one of plates and trays, and flowing it gradually downwardly,

(c) subjecting the interior of the vessel to an oxygen pressure of at least about 20 psi,

(d) conducting the introduced liquid in a substantially flowing contact with the oxygen, whereby the liquid is enriched with oxygen, and

(e) recovering all of the oxygen-enriched liquid.

5,814,223

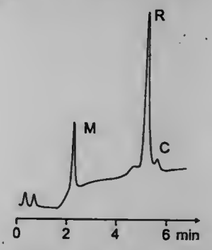
SELECTIVE RECOGNITION OF SOLUTES IN CHROMATORGRAPHIC MEDIA BY ARTIFICIALLY CREATED AFFINITY

Stellan Hjertén, and Jia-Li Liao, both of Uppsala, Sweden, assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Division of Ser. No. 618,879, Mar. 20, 1996, Pat. No. 5,728,296. This application Oct. 31, 1997, Ser. No. 961,969

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—635 **12 Claims**



1. A method for preparing an affinity chromatography medium with selective affinity for a preselected species, said method comprising:

(a) forming a insoluble polymer matrix from a polymerizable substance in the presence of said preselected species, said polymerizable substance being non-ionizable and one with respect to which said preselected species is inert; and

(b) extracting said preselected species from said insoluble polymer matrix.

5,814,224

METHOD FOR COMPLEX PROCESSING OF SEA-WATER

Ruslan Khazhsetovich Khamizov; Boris Fedorovich Myasoedov; Boris Antonovich Rudenko; Larisa Ivanovna Mironova; Evgeny Gennadievich Abramov; Olga Vladimirovna Fokina; Eduard Grigorievich Novitsky; Vladimir Pavlovich Vasilevsky; Semen Ilich Gdalio; Valery Davydovich Chernyaev; Mikhail Ekhilievich Shvarts; Alexandr Sergeevich Dzhardzhlmanov; Anatoly Nikolaevich Dmitrievsky; Kaplan Saferbievich Basniev, and Jury Anatolievich Rakhmanin, all of Moscow, U.S.S.R., assignors to Institut Geokhimii I Analiticheskoi Khimii IM.V.I.Vernadskogo Ran (Geokhi Ran); Aktsionernay a Kompania Po Transportu Nefti "Transneft"; Aktsionernoe Osbchestvo "Nauchno-Teknicheskaya Korporatsia"Chistaya Vode, and Gosudarstvennaya Akademia Nefti Gaza Im. I.M.Gubkina, all of Moscow, U.S.S.R.

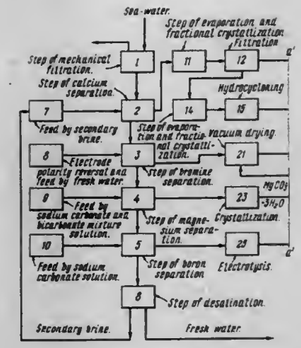
Filed Aug. 12, 1996, Ser. No. 695,695

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—638 **24 Claims**

1. A method for processing seawater comprising the following steps:

(a) filtering the seawater by passing the seawater through mechanical filtering means for separating the seawater into a



suspension and a first filtrate whereby to obtain the suspension and the first filtrate;

(b) passing the first filtrate through a zeolite in sodium form that has been treated with magnesium to enhance a selectivity of the zeolite for ion exchange of calcium and magnesium whereby to remove calcium from the filtrate so as to obtain partially softened seawater and a zeolite enriched in calcium;

(c) passing said partially softened seawater through a weak-acid cation exchanger to remove magnesium from the partially softened seawater whereby to obtain further softened seawater and a weak-acid cation exchanger enriched in magnesium;

(d) desalinating the further softened seawater to obtain fresh water and a secondary brine comprising salt in a concentration of at least 100 g/liter;

(e) passing said secondary brine through the zeolite enriched in calcium to obtain a regenerated zeolite and a mixed concentrate comprising calcium, sodium and potassium salts;

(f) passing a solution of sodium carbonate through the weak-acid cation exchanger enriched in magnesium to obtain a regenerated weak-acid cation exchanger and a resultant solution supersaturated with magnesium carbonate that settles upon standing;

(g) repeating at least steps (a) through (e) with the first filtrate being passed through the regenerated zeolite in a repeated step (b) and with the partially softened seawater being passed through the regenerated weak-acid cation exchanger in a repeated step (c).

5,814,225

IODINATED GEL FILTRATION MEDIA FOR DISINFECTING PROTEIN SOLUTIONS

Edward Shanbrom, Santa Ana, Calif., assignor to Shanbrom Technologies LLC, Ojai, Calif.

Continuation-in-part of Ser. No. 562,795, Nov. 27, 1995, abandoned, which is a continuation of Ser. No. 255,616, Jun. 9, 1994, abandoned. This application Jun. 21, 1996, Ser. No. 667,448

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—656 **12 Claims**

7. A method for disinfecting protein-containing solutions, the method comprising the steps of:

hydrating gel filtration material by mixing the gel filtration material into an aqueous medium, said gel filtration material containing at least 10% by weight elemental iodine;

pouring the hydrated gel filtration material into a container to produce an iodinating bed of the hydrated gel filtration material; and

allowing a protein containing solution to flow through the iodinating bed,

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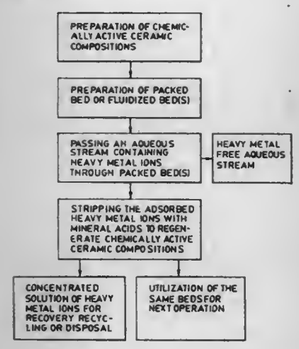
whereby elemental iodine held within the gel filtration material transfers to the protein solution destroying any viruses therein.

5,814,226

METHOD OF REMOVING HEAVY METAL IONS FROM A LIQUID WITH CHEMICALLY ACTIVE CERAMIC COMPOSITIONS WITH A THIOL AND/OR AMINE MOIETY

Lawrence L. Tavlarides, Fayetteville, and Nandu Deorkar, Syracuse, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

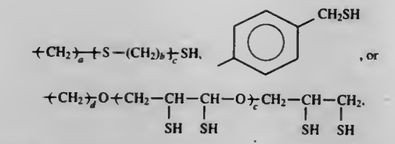
Division of Ser. No. 313,349, Sep. 27, 1994, Pat. No. 5,616,533.
This application Jan. 27, 1997, Ser. No. 788,396
Int. Cl.[6] B01D *15/00;* **C02F** *1/28*
U.S. Cl. 210—661 **37 Claims**



1. A method of removing heavy metal ions from a liquid stream comprising the step of contacting the stream with a composite material under conditions effective to complex said heavy metal ions on said composite material, said composite material having the formula

$$R_2-\underset{\underset{R_1}{|}}{\overset{\overset{R_3}{|}}{Si}}-R_4 \qquad (I)$$

wherein at least one of R_1–R_3 is SUPPORT-O- and other of R_1–R_3 are the same or different and are unsubstituted or halosubstituted alkyl groups having 1–5 carbon atoms and R_4 is



wherein

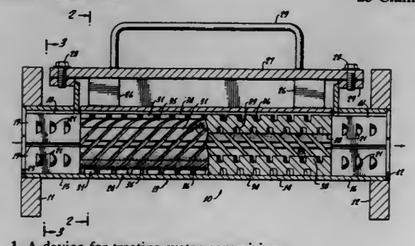
a is an integer from 1–20, b is an integer from 2–8, c is an integer from 0–5, and d is an integer from 1–5.

5,814,227

WATER TREATMENT ARRANGEMENT

Donald W. Pavlis, Riverside, Calif., assignor to Glendon Family Trust, Riverside, Calif.

Continuation of Ser. No. 534,619, Sep. 27, 1995, abandoned.
This application Mar. 28, 1997, Ser. No. 825,438
Int. Cl.[6] C02F *1/70*
U.S. Cl. 210—696 **23 Claims**



1. A device for treating water comprising:

a housing having an inlet end and outlet end;

a first palladium catalyst in said housing adjacent said inlet end adapted to lower the pH of water entering said housing to a value below substantially 6.4; and

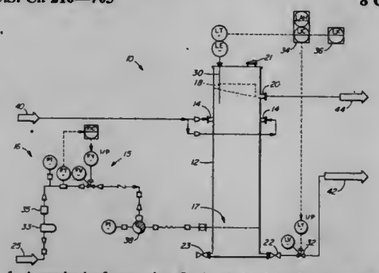
a second catalyst in said housing downstream of said first catalyst, said second catalyst comprising an alloy of copper, tin, nickel and zinc.

5,814,228

FLOTATION METHOD AND APPARATUS

Gale L. Hubred, Bren, Calif.; William A. C. Meekel, Kamloops, and Harold E. Wyslouzil, Delta, both of Canada, assignors to Cominco Engineering Services Ltd., Vancouver, Canada

Division of Ser. No. 429,746, Apr. 26, 1995, Pat. No. 5,643,459.
This application Jul. 24, 1996, Ser. No. 685,778
Int. Cl.[6] C02F *1/24*
U.S. Cl. 210—703 **8 Claims**



1. A method of removing finely divided bodies of an insoluble substance dispersed in an aqueous medium, from said medium, comprising the steps of:

providing a column having a plurality of longitudinally extending baffles therein for dividing the column into a plurality of longitudinal segments, each of said segments having a ratio of height to diameter of at least about 10 to 1;

causing said aqueous medium to flow downwardly in each longitudinal segment of said column at a superficial velocity in the range of from about 0.2 to about 1.6 inch/second;

generating gas bubbles of a substantially uniform size in the range of from about 0.004 to about 0.2 inches in diameter at the bottom of each segment of the column;

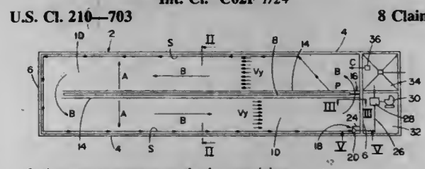
causing the gas bubbles to rise up in the column in countercurrent fashion to the flow of said aqueous medium at a superficial velocity in the range of from about 0.04 to about 1.6 inches/second in order to contact said bodies of insoluble substance and to capture said bodies and raise them to the surface of the aqueous medium in the column to form a layer of said insoluble substance on the surface of the aqueous medium.

5,814,229

WATER TREATMENT METHOD AND APPARATUS

Elvind Lygren, Oslo, Norway, assignor to Puraq AS, Oslo, Norway

PCT No. PCT/NO95/00027, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/21134, PCT Pub. Date Aug. 10, 1995
PCT Filed Feb. 6, 1995, Ser. No. 687,525
Claims priority, application Norway, Feb. 7, 1994, 940390
Int. Cl.[6] C02F *1/24*
U.S. Cl. 210—703 **8 Claims**



1. A water treatment method comprising:

introducing water to be treated into a basin having a closed bottom and an outer wall;

aerating said water by means of stationary diffusor means located at said bottom spaced from said outer wall to produce air bubbles of varying size acting to lift water impurities toward the surface of said water and to positively circulate said water in said basin as a first stream flowing vertically upwardly from said diffusor means, horizontally toward said basin outer wall, vertically downwardly at said outer wall and horizontally along said bottom of said basin back toward said diffusor means, said water impurities forming a polluted foam and slurry in a layer on top of said surface of said water;

causing said water to circulate as a second stream circumferentially in said basin, said first and second circulating streams cooperating to concentrate said foam and slurry layer formed on said surface in an outer peripheral flow path; and

removing said foam and slurry layer from said basin at at least one position along said peripheral flow path.

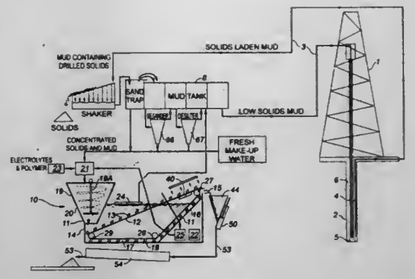
5,814,230

APPARATUS AND METHOD FOR SEPARATION OF SOLIDS FROM LIQUID

H. Craig Willis, 2447 Uxbridge Drive N.W., Calgary, Alberta, Canada, T2N 3Z8; Bradley C. Willis, #1, 536-19th Avenue S.W., and W. Brent Willis, 441-13th Street N.W., both of Calgary, Alberta, Canada, T2S 0E2

Filed Aug. 30, 1996, Ser. No. 697,792
Int. Cl.[6] B01D *21/01*
U.S. Cl. 210—710 **33 Claims**

1. A process of separating solids from liquid, the process comprising:



providing a settling tank having sides, a bottom and first and second ends,

flowing liquid containing suspended solids into the tank's first end;

maintaining a liquid level in the tank;

separating at least a portion of the suspended solids by gravity which settle onto the tank's bottom;

continuously advancing a plurality of spaced-apart screens along an endless path which includes at least descending into the liquid from a first point above the liquid at the tank's second end to a second point on the tank's bottom, then advancing laterally to a third point on the bottom unique from the second point and adjacent the first end of the tank, and then, ascending to exit the liquid and return to the first point wherein solids are collected on the screens for clarifying the liquid, firstly by dredging solids which have settled by gravity as the screens are advanced along the bottom of the tank between the second and third points, and secondly by filtering progressively finer solids from the suspended solids through the formation of a filter cake of solids on the screens;

substantially dewatering the collected solids by firstly vibrating the solids-containing screens which lay along the ascending portion of the path and are above the liquid level and secondly by directing blasts of air onto the collected solids contained in the screens;

advancing the screens to a fourth point external to the tank;

recovering dewatered collected solids external to the tank by firstly inverting the screens at the fourth point and secondly by directing air onto the back of the inverted screens; and

withdrawing clarified liquid from the second end of the tank at a point adjacent the surface of the liquid.

5,814,231

SEPARATION OF LIQUID EUTECTIC MIXTURES BY CRYSTALLIZATION ON COLD SURFACES AND APPARATUS FOR THIS PURPOSE

Klaus Borho, Mutterstadt; Jörg Heilek, Bammental, and Gunter Schnabel, Fussgönheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 9, 1996, Ser. No. 711,017
Claims priority, application Germany, Oct. 2, 1995, 195 36 827.4
Int. Cl.[6] C30B *21/00*
U.S. Cl. 210—737 **8 Claims**

1. A process for separating a liquid eutectic mixture, which process comprises crystallizing one eutectic-forming substance of the mixture on a cold surface to which seed crystals of the eutectic-forming substance have been previously applied as a seed crystal layer in the form of a solidified liquid film, and subse-

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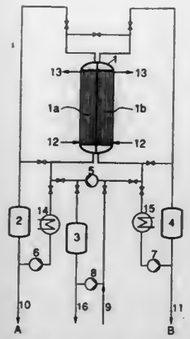


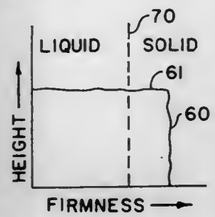
quently removing the eutectic-forming substance in liquid form after heating the surface.

5,814,232

METHOD OF SEPARATING CONSTITUTENT INGREDIENTS OF MIXTURES BY STAGED RESONANT FREQUENCY VIBRATION

Samuel A. Face, Jr.; Glenn F. Rogers, Jr., both of P.O. Box 6389, Norfolk, Va. 23508; Richard P. Bishop, P.O. Box 10495, Burke, Va. 22009; Darrell L. Darrow, and Brad Face, both of P.O. Box 6389, Norfolk, Va. 23508

Continuation-in-part of Ser. No. 160,916, Dec. 3, 1993, Pat. No. 5,520,862. This application Mar. 5, 1996, Ser. No. 610,982
Int. Cl.[6] C02F *1/00*
U.S. Cl. 210—739 **8 Claims**



1. A method of separating constituent ingredients of a mixture, wherein one of said ingredients is a fluid and one of said ingredients is a solid, and wherein said mixture extends between horizontally spaced apart first and second regions, comprising the following steps:

vertically oscillating a linear oscillator member at a first frequency;

introducing into a first region of said mixture a first series of vibrations at said first frequency from said oscillator member;

said first series of vibrations causing accelerated upward migration of a fluid ingredient of said mixture to provide a first segment of said mixture within said first region of said mixture located beneath the oscillator member to contain a relatively higher concentration of said fluid ingredient than a second segment of said mixture within said first region of said mixture located beneath said first segment of said mixture;

said first segment of said mixture and said second segment of said mixture being separated by a manipulatable definable boundary layer disposed between said first segment of said mixture and said second segment of said mixture;

subsequent to said step of introducing into said first region of said mixture a first series of vibrations at said first frequency from said oscillator member, sensing a resonant frequency indicative condition of the first segment of said mixture;

adjusting the frequency of vertically oscillating said linear oscillator member from said first frequency to a second frequency in response to a sensed condition of the mixture;

subsequent to said step of adjusting the frequency of vertically oscillating said linear oscillator member from said first frequency to a second frequency, introducing into said first segment of said mixture, a second series of vibrations at said second frequency from said oscillator member;

said second series of vibrations continuing the accelerated upward migration of said fluid ingredient of said mixture and reducing the size of said first segment and increasing the size of said second segment;

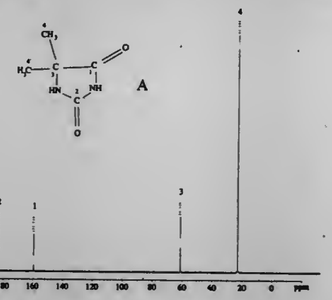
wherein said steps of introducing into said first region of said mixture said first series of vibrations and introducing into said first segment of said mixture said second series of vibrations separates said fluid ingredient from a solid ingredient of said mixture in said first region.

5,814,233

COMPOSITIONS AND METHODS FOR TREATING WATER

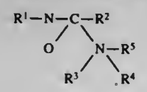
Ron Starkey, Lawrenceville; Kysler DeGuzman, Tucker; Geoffrey A. Brown, Lithonia, and P. Kirk Mitchell, Marietta, all of Ga., assignors to Great Lakes Chemical Corporation, West Lafayette, Id.

Filed Nov. 10, 1997, Ser. No. 966,673
Int. Cl.[6] C02F *1/72*
U.S. Cl. 210—759 **37 Claims**



1. A method of remediating methyl amine and methyl amine derivative odors in aqueous systems, the method comprising binding the methyl amine or methyl amine derivative to a methyl amine-binding amide/imide composition, wherein:

(a) said methyl amine-binding amide/imide composition is a composition that does not deliver active halogen to the aqueous system, but which has at least one amide or imide functional group effective to bind a methyl amine or methyl amine derivative to produce a compound of the formula:



with:

R^1 and R^2 being the substituents of the methyl amine-binding amide/imide composition which are adjacent to the amide or imide functional group; and

R^3, R^4, and R being the substituents of the methyl amine or methyl amine derivative which are adjacent to the central N of the methyl amine or the methyl amine derivative; and

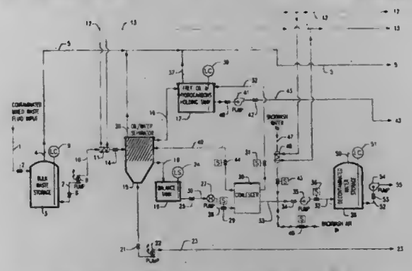
(b) said binding is effected by contacting the methyl amine or methyl amine derivative with said methyl amine-binding amide/imide composition in the presence of a peroxygen compound.

5,814,234

INTEGRATED SOIL AND FLUID DECONTAMINATION SYSTEM

C. George Bower, Amherst, N.H., and Allan W. Bernat, Lowell, Mass., assignors to Prosys Corporation, Chelmsford, Mass.

Filed Aug. 14, 1996, Ser. No. 696,499
Int. Cl.[6] B01D *37/00*
U.S. Cl. 210—770 **26 Claims**



1. An integrated soil and fluid decontamination process including a coalescer, a thermal desorption unit having a contaminated soil input, and an oxidizer, said method comprising the steps of:

separating waste fluid comprising mixed water and oil into water, sludge and hydrocarbons;

further separating the water in the coalescer to remove remaining hydrocarbons from the water;

heating contaminated soil in the thermal desorption unit to volatilize the contaminant hydrocarbons in the soil thereby producing decontaminated soil;

adding water from the coalescer to the decontaminated soil to cool the decontaminated soil following said step of heating; and

combusting in the oxidizer, volatilized hydrocarbons produced in said step of heating, to produce flue gases.

10. An integrated soil and fluid decontamination process including a coalescer, a thermal desorption unit having a contaminated soil input, and an oxidizer, said method comprising the steps of:

separating waste fluid comprising mixed water and oil into water, sludge and hydrocarbons;

further separating the water in the coalescer to remove remaining hydrocarbons from the water;

heating contaminated soil in the thermal desorption unit to volatilize the contaminant hydrocarbons in the soil thereby producing decontaminated soil, wherein said step of heating includes burning the hydrocarbons produced in said step of separating waste fluid, said step of burning producing an exhaust gas; and

combusting in the oxidizer, volatilized hydrocarbons produced in said step of heating, to produce flue gases.

5,814,235

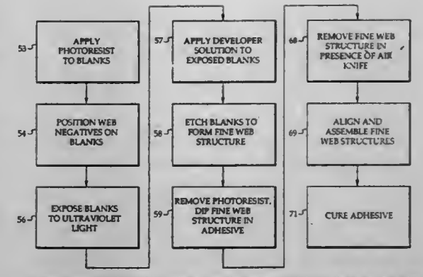
AIR CROSS GRIDS FOR MAMMOGRAPHY AND METHODS FOR THEIR MANUFACTURE AND USE

Anthony J. Pellegrino, New Fairfield; Daniel N. Lyke, New Milford, both of Conn.; David P. Lieb, Lexington; Joseph A. Buturlia, West Boxford, both of Mass., and Michael P. Appleby, Charlottesville, Va., assignors to Thermo Trex Corporation, San Diego, Calif.

Division of Ser. No. 438,172, May 9, 1995, Pat. No. 5,606,589. This application Dec. 3, 1996, Ser. No. 759,798
Int. Cl.[6] B44C *1/22*; C23F *1/00*
U.S. Cl. 216—12 **8 Claims**

1. A method of fabricating an air cross grid comprising the steps of:

forming by chemical milling photo-etching, a plurality of metal foil sheets into a plurality of fine web structures each having a large plurality of openings therethrough, defined by two pluralities of partition segments extending in substantially transverse respective directions and preserved by photoresist during masking, ultraviolet irradiation and etching of the metal foil sheets,



removing the remaining photoresist from each fine web structure,

dipping each fine web structure in a liquid adhesive bath,

moving each fine web upward from said liquid adhesive bath between two air knives directing compressed gas laterally toward each web and penetrating the openings therethrough, thereby removing all but a thin coating of liquid adhesive from the surfaces of said web structure,

aligning each web structure in turn with an underlying web structure, with all of said openings substantially in registration, until the desired number of layers of aligned web structures have been combined to produce the required plurality of fine web structures,

maintaining said aligned plurality of fine web structures in alignment while applying clamping pressure thereto for the time required for curing the liquid adhesive coatings,

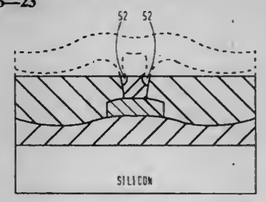
whereby a sturdy, rigid air cross grid panel is produced having a large plurality of open air passages therethrough.

5,814,236

METHOD FOR FORMING A FERROELECTRIC SPATIAL LIGHT MODULATOR UTILIZING A PLANARIZATION PROCESS

John Stanley Booth, Austin, Tex., assignor to Rainbow Display Devices, Inc., Boulder, Colo.

Continuation of Ser. No. 503,036, Jul. 17, 1995, Pat. No. 5,611,941. This application Mar. 18, 1997, Ser. No. 819,924
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—23 **7 Claims**



1. A method for forming a spatial light modulator, comprising the steps of:

providing a substrate;

forming control elements having conductive areas on the substrate to form a control structure, the control structure having an irregular surface;

depositing disposing a conformal layer of insulating material over the upper surface of the control structure;

forming vias in the insulating layer to expose select portions of the conductive areas;

disposing a conformal layer of conductive material over the insulating layer and vias to fill the vias;

downwardly etching the conformal layer of conductive material to remove substantially all of the conformal layer of conduc-

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tive material with the exception of a portion thereof that is disposed in the vias as plugs;

chemically planarizing the surface of the resultant structure such that the plugs are not removed therefrom;

forming mirrored elements on the upper surface of the resultant structure over substantially all of the remaining portions of the plugs; and

disposing a layer of liquid crystal material over the resultant structure that has characteristics that will change in response to a voltage applied to the mirrored elements.

5,814,237

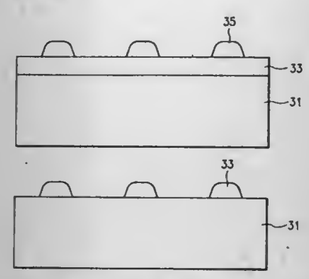
METHOD FOR FORMING DEFLECTION GRATING

Chong-Dae Park, Daejeon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute, Daejeon, and Korea Telecommunication Authority, Seoul, both of Rep. of Korea

Filed Sep. 26, 1996, Ser. No. 721,337

Int. Cl.[6] H01L *21/00*

U.S. Cl. 216—24 **8 Claims**



1. A method for forming a deflection grating, comprising the steps of:

sequentially forming a dielectric layer and photoresist layer on a compound semiconductor substrate, and patterning said photoresist layer through optical holography to expose said dielectric layer;

removing a portion of said dielectric layer on which said patterned photoresist layer is not formed, through reactive ion etching (RIE) using said patterned photoresist layer as a mask;

anisotropically etching a portion of said semiconductor substrate on which said dielectric layer is not formed, through RIE using said dielectric layer as a mask, to form a deflection grating; and

removing said dielectric layer.

5,814,238

METHOD FOR DRY ETCHING OF TRANSITION METALS

Carol I. H. Asbby, Edgewood; Albert G. Baca, Albuquerque; Peter Esherick, Albuquerque; John E. Parmeter, Albuquerque; Dennis J. Rieger, Tijeras, and Randy J. Shul, Albuquerque, all of N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Oct. 12, 1995, Ser. No. 542,149

Int. Cl.[6] B44C *1/22;* **C23F** *1/00;* **C03C** *15/00*

U.S. Cl. 216—62 **69 Claims**

1. A method for dry etching of a transition metal on a substrate, comprising the steps of:

(a) providing a phosphite ligand comprising $P(OR)_3$ in proximity to the transition metal; and

(b) etching the transition metal and forming a volatile complex comprising the phosphite ligand and the transition metal.

5,814,239

GAS-PHASE ETCHING AND REGROWTH METHOD FOR GROUP III-NITRIDE CRYSTALS

Yawara Kaneko, Fuchu, and Norihide Yamada, Kokubunji, both of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1996, Ser. No. 684,608

Claims priority, application Japan, Jul. 29, 1995, 7-212374

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—63 **17 Claims**

1. A method for gas-phase etching a Group III-nitride crystal, the method comprising steps of:

providing a gas-phase etchant including at least one of a halogen in gaseous form and a hydrogen halide in gaseous form;

heating the Group III-nitride crystal to a temperature in the range of 500°–900° C.; and

etching the Group III-nitride crystal in a flow of the gas-phase etchant.

5,814,240

METHOD FOR POLISHING A SEMICONDUCTOR WAFER

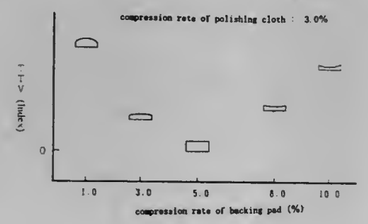
Junichi Yamashita, Miyazaki-gun, Japan, assignor to Komatsu Electronic Metals Co., Ltd., Hiratsuka, Japan

Filed Feb. 27, 1997, Ser. No. 805,676

Claims priority, application Japan, Feb. 29, 1996, 8-084455

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—88 **4 Claims**



1. A method for polishing a semiconductor wafer, comprising holding the semiconductor wafer with a polishing block consisting of a ceramic plate, a backing pad and a template, and pressing the semiconductor wafer against a polishing cloth, characterized in that the compression rate of said backing pad is greater than the compression rate of said polishing cloth.

5,814,241

NON-VAPORIZING GETTER AND METHOD OF OBTAINING THE SAME

Nina Pavlovna Reutova; Sergei Jurievich Manegin; Jury Mikhailovich Pustovoit, and Vladimir Leonidovich Stolyarov, all of Moscow, Russian Federation, assignors to Tovarischetstvo S Organichennoi Otvetstvennostiu "Tekhnovakt"

Filed Jun. 3, 1997, Ser. No. 868,232

Int. Cl.[6] H01J *7/18;* **B22F** *1/00*

U.S. Cl. 232—181.1 **6 Claims**

1. A nonevaporable getter prepared from a metal powder comprising a titanium-vanadium alloy containing from 20 to 35% by weight of vanadium, from 0.1% to 0.5% by weight of calcium, the balance being titanium, said metal powder having a bulk density in the range from about 0.7 to about 1.5 g/cm^3, said getter comprising from 20 to 35% by weight of vanadium, from 0.1 to 0.5% by weight of calcium, the balance being titanium, wherein said getter has a porosity from 25 to 65% by volume.

5,814,242

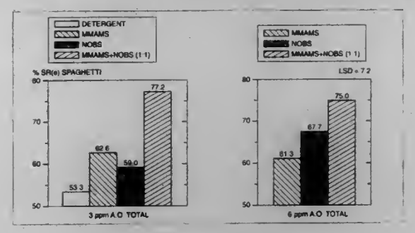
MIXED PEROXYGEN ACTIVATOR COMPOSITIONS

Vincent E. Alvarez; James E. Deline, both of Livermore; Lafayette D. Foland, Dublin; Thomas W. Kaaret, Alamo; Michael J. Petrin, Antioch; William L. Smith, Pleasanton; Barry A. Sudbury, Pleasanton, and Alfred G. Zielske, Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 475,292, Jun. 7, 1995, Pat. No. 5,739,327. This application Nov. 29, 1996, Ser. No. 758,545

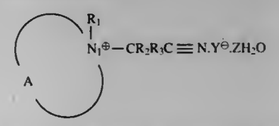
Int. Cl.[6] C09K *3/00;* **C11D** *3/39*

U.S. Cl. 252—186.39 **12 Claims**



1. A composition, useful in bleaching, comprising:

a heterocyclic cationic species either capable of forming a peroxyimidic acid with a source of active oxygen in aqueous solution or being in a peroxyimidic form, said species capable of forming peroxyimidic acid is a compound with the structure of Formula I



FORMULA I

wherein A is a saturated ring formed by a plurality of atoms in addition to the N_1 atom, the saturated ring atoms to include at least one carbon atom and at least one heteroatom in addition to the N_1 atom, the said one heteroatom selected from the group consisting of O, S, and N atoms, the substituent R_1 bound to the N_1 atom of the Formula I structure is either (a) a C_{1-24} akyl or alkoxylated akyl where the alkoxy is C_{2-4}, (b) a C_{4-24} cycloalkyl, (c) a C_{7-24} alkaryl, (d) a repeating or nonrepeating alkoxy or alkoxylated alcohol, where the alkoxy unit is C_{2-4}, or (e) $—CR_2'R_3'C{\equiv}N$ where R_2' and R_3' are each H, a C_{1-24} alkyl, cycloalkyl, or alkaryl, or a repeating or nonrepeating alkoxyl or alkoxylated alcohol where the alkoxy unit is C_{2-4}, and R_2 and R_3 substituents being each H, a C_{1-24} alkyl, cycloalkyl, or alkaryl, or a repeating or nonrepeating alkoxyl or alkoxylated alcohol where the alkoxy unit is C_{2-4}, Z is in the range of 0 to 10, and wherein Y is counterion; and,

an anionic species either capable of forming a peracid with a source of active oxygen in aqueous solution, or being in a peracid form, or a non-ionic polarizable peracid activator and suitable counterion.

5,814,243

Patent Not Issued For This Number

5,814,244

POLYMERS COMPRISING TRIAYLAMINE UNITS AS ELECTROLUMINESCENCE MATERIALS

Willi Kreuder, Mainz; Hans-Heinrich Hörhold, and Henning Rost, both of Jena, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

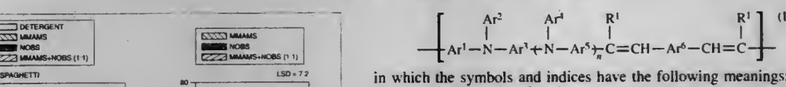
Filed Sep. 3, 1996, Ser. No. 711,367

Claims priority, application Germany, Sep. 4, 1995, 195 32 574.5; Sep. 27, 1995, 195 35 938.0

Int. Cl.[6] C08G *12/04;* **C09K** *11/06;* **H05B** *33/14*

U.S. Cl. 252—301.16 **14 Claims**

1. An electroluminescence device having one or more active layers, where at least one of these active layers is an electroluminescence material, comprising one or more polymers which comprise structural units of the formula (I),



in which the symbols and indices have the following meanings:

Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, Ar^6 are identical or different, monocyclic and/or polycyclic aryl and/or heteroaryl groups which may be linked via one or more bridges and/or be condensed and may be unsubstituted or substituted, where Ar^1, Ar^3, Ar^5 and Ar^6 are each divalent and Ar^2 and Ar^4 are each monovalent;

R^1 is H, a hydrocarbon radical having from 1 to 22 carbon atoms which may be unsubstituted or substituted, and can also contain heteroatoms, or Ar^7, where Ar^7 is, independently of Ar^{1-6}, as defined for Ar^{1-6};

n is 0, 1 or 2.

5,814,245

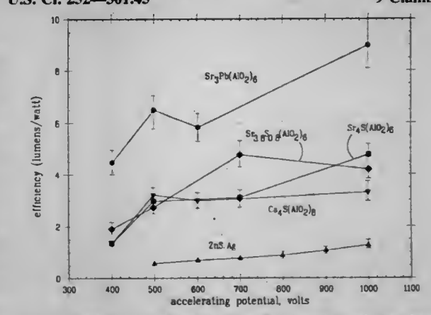
FLUORESCENT AND CATHODOLUMINESCENT PHOPHORS STRUCTURALLY RELATED TO SODALITE

Mark L. F. Phillips, Tijeras, N. Mex., and Lauren E. Shea, San Diego, Calif., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Mar. 27, 1997, Ser. No. 827,146

Int. Cl.[6] C09K *11/64;11/56;11/66;11/55*

U.S. Cl. 252—301.45 **9 Claims**



1. A method of making blue-color phosphor of the form $M_3PbS(AlO_2)_6$, having stability in air, comprising:

heating a mixture of a compound containing the metal M, a lead compound, an aluminum compound, and ammonium sulfate to form a metal sulfoaluminate wherein M is strontium or calcium; and

chemically reducing the metal sulfoaluminate in a reducing gas at temperatures from about 600° C. to about 1000° C. to form the blue-phosphor $M_3PbS(AlO_2)_6$ product.

5,814,246

Patent Not Issued For This Number

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5,814,247

AQUEOUS SOLUTION FOR THE COLD-WORKING TREATMENT OF STEEL SHEET

Hervé Derule, Metz; Valérie Bour Beucler, Marco En Baroeuil, and Jean Steinmetz, Laxou, all of France, assignors to Sollac, Puteaux, France

Filed Dec. 9, 1996, Ser. No. 760,671
Claims priority, application France, Dec. 7, 1995, 95 14440
Int. Cl.[6] C23F *11/167*
U.S. Cl. 252—396 **8 Claims**

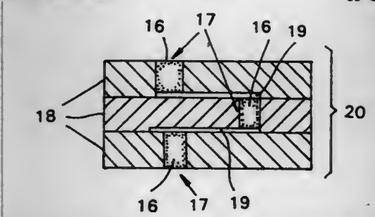
1. An aqueous solution comprising less than or equal to 2×10^{-2} mol/liter of a water-soluble salt of heptanoic acid, an oxidizing agent, and a wetting agent, wherein the molar concentration of the oxidizing agent is 0.1–1 times the molar concentration of said water-soluble salt of heptanoic acid.

5,814,248

CONDUCTIVE PASTE COMPOSITION AND METHOD FOR PRODUCING A CERAMIC SUBSTRATE

Hiroji Tani, Nagaokakyo, and Kazuhito Ohshita, Omihachiman, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 19, 1997, Ser. No. 858,743
Claims priority, application Japan, May 24, 1996, 8-129668; Apr. 14, 1997, 9-095812
Int. Cl.[6] H01B *1/22*
U.S. Cl. 252—512 **13 Claims**



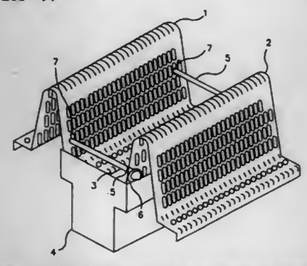
1. A conductive paste composition comprising an organic vehicle, copper powder and an organometallic resinate in which the metal component is at least one metal selected from the group consisting of Pt, Ni and Bi.

5,814,249

SUPPORT PLATE

Michael J. Dolan, Brecksville, Ohio, assignor to Norton Chemical Process Products Corporation, Stow, Ohio

Filed Mar. 20, 1997, Ser. No. 821,628
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—97 **2 Claims**



1. A support plate for supporting a plurality of mass transfer elements in a mass transfer tower which comprises a plurality of separate parallel elongated channel beams each having a generally inverted U-shaped cross-section with each beam generally in contact with at least one adjacent beam and, suspended below the line along which adjacent beams are in contact, a trough with a generally U-shaped cross-section having at least one outflow point and extending essentially the length of the line of contact between adjacent beams.

5,814,250

METHOD OF PROTECTING A STRUCTURE

Philip J. Dudt, Rockville, and John R. Martin, Union Bridge, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1996, Ser. No. 710,498
Int. Cl.[6] E04B *1/16*
U.S. Cl. 264—31 **12 Claims**

1. A method of protecting a desired portion of a structure from ballistic impact and penetration, said method comprising the steps of:

providing a mold defining therein a predetermined shape;

providing a mixture of microspheres within a volumetric range of 40 to 80 percent and an uncured binder material within a volumetric range of 20 to 60 percent;

pouring said mixture into said mold;

curing said mixture to form a syntactic foam barrier material in the form of said predetermined shape adapted to absorb and contain ballistic projectiles while maintaining structural integrity upon ballistic impact and penetration; positioning one or more penetration impeding layers within the barrier material for decreasing penetration of the ballistic projectiles; and

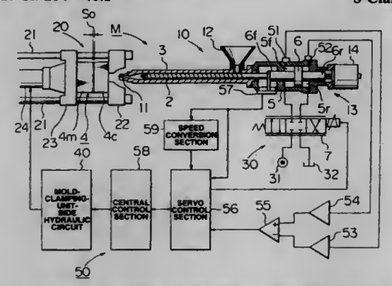
placing said barrier material in a relationship with said structure wherein said desired portion of said structure is protected from ballistic impact and penetration.

5,814,251

MOLDING METHOD OF INJECTION MOLDING MACHINE

Tsuyoshi Arai; Nobuyuki Nakamura; Makoto Nakazawa, and Toshiyasu Koda, all of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan

Filed Mar. 21, 1995, Ser. No. 551,268
Claims priority, application Japan, Mar. 22, 1994, 6-076714
Int. Cl.[6] B29C *45/76*
U.S. Cl. 264—40.1 **8 Claims**



1. A method of operation for an injection molding machine, the injection molding machine including an injector having an advancable screw and a barrel cylinder, and a mold clamp for holding a mold with a controllable pressure and for allowing the mold to open a controllable amount, the method comprising the steps of:

establishing preset values for a preset stop position of the advancable screw, a preset clamping pressure of the mold clamp, and a preset opening amount for the mold based upon an amount of resin necessary to form a desired molded object;

advancing the screw up to the preset stop position;

injecting the resin in the barrel cylinder into the mold;

stopping the screw at the preset stop position;

controlling the screw so as to ensure positioning of the screw at the preset stop position for a preset time;

clamping the mold with the preset clamping pressure, during the preset time, by operating the mold clamp while maintaining the positioning of the screw at the preset stop position; and

operating the mold clamp to controllably allow for opening of the mold during the injecting step, so that the mold is allowed to open to the preset opening amount as the injecting step is completed;

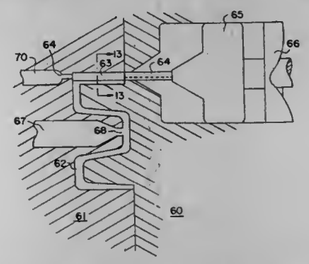
wherein the step of advancing the screw includes controlling the speed of the advancing screw and braking the speed of the advancing screw at a predetermined braking position before the preset stop position.

5,814,252

METHOD OF MOLDING COINJECTED PLASTIC GARMENT HANGERS

Stanley Gouldson, Northport; Roland Harmer, Centereach, and Olaf Olk, Hauppauge, all of N.Y., assignors to Spotless Plastics Pty. Ltd., Australia

Continuation of Ser. No. 315,610, Sep. 30, 1994, Pat. No. 5,785,216, which is a continuation-in-part of Ser. No. 885,291, May 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 776,779, Oct. 17, 1991, Pat. No. 5,252,025. This application Jun. 7, 1995, Ser. No. 484,325
Int. Cl.[6] B29C *33/02;45/14;45/78;45/33*
U.S. Cl. 264—40.5 **21 Claims**



1. A method of molding a composite plastic garment hanger formed of first and second plastic materials, said method comprising:

(a) advancing a retractable mold core into a mold for a plastic hanger, said retractable mold core defining a mechanical joint pattern for a portion of a composite hanger to be molded in said mold to create a first mold cavity which defines a first section of a mechanical joint pattern within said mold;

(b) injecting a first plastic material into said first mold cavity to form a first portion of said composite plastic garment hanger and a first section of said mechanical joint pattern, and partially cooling said first material;

(c) retracting said retractable mold core to define, in combination with the first plastic material, a second mold cavity which defines a second section of said mechanical joint pattern;

(d) injecting a second plastic material into the second mold cavity to form a second portion of said composite plastic garment hanger and a second section of said mechanical joint pattern to form an interlocking mechanical joint pattern;

(e) controlling the partial cooling of said first material in step (b) and the temperature and injection pressure of the injecting step set forth in step (d) to provide thermal deformation in a boundary zone between the first and second sections of said mechanical joint pattern, wherein said first plastic material forming the first section of the mechanical joint pattern is thermally deformed with said second section of said mechanical joint pattern to form said interlocking mechanical joint pattern with thermal deformation of both sections;

(f) cooling said mold to solidify said first and said second plastic materials;

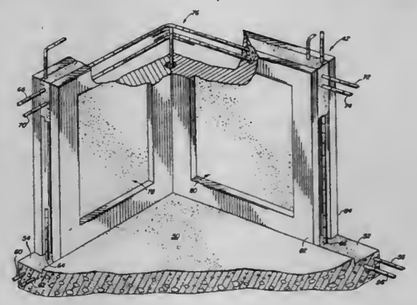
(g) ejecting said composite plastic garment hanger from said mold.

5,814,253

PROCESS FOR MAKING A LIGHTWEIGHT, CEMENTITIOUS, THREE DIMENSIONAL STRUCTURE

Faiz Sikaffy, San Pedro Sula, Honduras; Osvaldo Moran, Miami, and Eugene Berger, Lake Worth, both of Fla., assignors to Thermoflex, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 036,700, Mar. 25, 1993, Pat. No. 5,397,516. This application Mar. 14, 1995, Ser. No. 403,109
Int. Cl.[6] B28B *1/50;1/52;* **C04B** *14/38;38/00*
U.S. Cl. 264—42 **15 Claims**



1. The process of making a lightweight, cementitious three dimensional structure comprising the steps of:

(a) measuring a quantity of water;

(b) measuring a quantity of about 425 kilograms of cement and a quantity of between about 40 to 60 grams ferric chloride in 40% solution by volume per about 278 liters of said water;

(c) mixing said quantity of water, said quantity of cement and said quantity of ferric chloride to form a mixture;

(d) measuring a quantity between about 0.620 kilograms and 1.347 kilograms of aluminum, a quantity between about 0.230 kilograms and 0.710 kilograms of a silicate derivative, a quantity between about 0.560 and 0.680 kilograms of a calcium derivative, and a quantity between about 4 and 8 kilograms of fiber per about 278 liters of water;

(e) combining said mixture of said cement, said ferric chloride and said water with said quantity of aluminum, said quantity of said silicate derivative, and said quantity of said calcium derivative and said fiber;

(f) mixing said combination of said mixture of said cement, said ferric chloride and said water with said quantity of said aluminum, said quantity of said silicate derivative, said quantity of said calcium derivative and said fiber;

(g) waiting until said mixed combination of said mixture of said cement, said ferric chloride and said water with said quantity of aluminum, said quantity of said silicate derivative, said quantity of said calcium derivative and said fiber rises; and

(h) forming said lightweight, cementitious, three dimensional structure from said mixed combination of step (g) of said mixture of said cement, said ferric chloride and said water with said quantity of aluminum, said quantity of said silicate derivative, said quantity of said calcium derivative and said fiber subsequent to said mixed combination rising.

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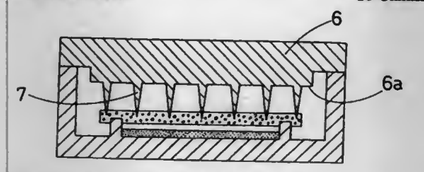
5,814,254

INJECTION MOLDING METHOD FOR SOLES HAVING A TREADING SURFACE WITH COLORED SECTIONS AND PRODUCED WITH EXPANSIBLE AND CROSS-LINKING "EVA"COMPOUNDS

Bruno Bisconti, Civitanova Marche (MC), Italy, assignor to Finproject-S.P.A., Rome, Italy

Filed Feb. 26, 1997, Ser. No. 806,683
Claims priority, application Italy, Apr. 19, 1996, AN960009
Int. Cl.[6] B29C *44/12*
U.S. Cl. 264—46.4 **16 Claims**



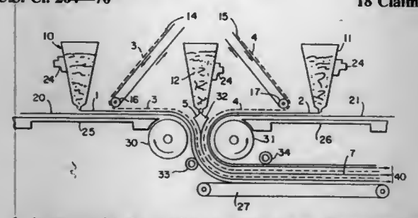
1. A molding method, comprising the steps of:
providing a mold with a cup portion defined at least in part by a rib;
fitting an insert in said cup portion of said mold, said insert being formed of a first molding material;
fitting a cap on said cup portion of said mold, said cap being formed of a second molding material;
closing said mold;
injecting into said mold a third molding material;
causing the first molding material of the insert and the second molding material of the cap to reach a molten state; and
opening the mold after a time that ensures crosslinking and decomposition of expanding fillers simultaneously in the injected third molding material, a molten mass of the insert and a molten mass of the cap.

5,814,255

PROCESS AND DEVICE FOR THE CONTINUOUS PRODUCTION OF FIBER-REINFORCED MOLDED BODIES FROM HYDRAULICALLY SETTING MATERIALS

Wolfgang Weiser, Düsseldorf; Gerd Joy; Melanie Gerling-Joy, both of Wuppertal, and Frank Cipriani, Düsseldorf, all of Germany, assignors to Durapact Gesellschaft für Glasfaserbetontechnologie mbH, Düseldorf, Germany

PCT No. PCT/EP95/01741, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO95/30520, PCT Pub. Date Nov. 16, 1995
PCT Filed May 9, 1995, Ser. No. 737,396
Claims priority, application Germany, May 9, 1994, 44 16 160.3
Int. Cl.[6] B28B *11/00*
U.S. Cl. 264—70 **18 Claims**



1. A process for the continuous production of fiber-reinforced molded bodies from hydraulically setting materials, the process comprising applying setting materials in a given width from at least two dispensers with a defined thickness in at least two separate layers on conveying means moving in opposite directions, wherein fibers serve as reinforcement, the process further comprising:

(a) applying the layers of setting materials and surface structures of reinforcing fibers on the conveying means comprising substrates whose color and external constitution corresponds to an outer surface of the fiber-reinforced molded body;

(b) moving the layers with the substrates together and conveying the layers with the substrates with the use of cylinder rollers and simultaneous injection of another material layer as an intermediate layer through an adjustable gap formed by the cylinder rollers, and uniting and connecting the layers and the substrates on the predetermined controlled pressure to form the fiber-reinforced molded body which is shaped on both outer surfaces, and subjecting the fiber-reinforced molded body to a thickness sizing; and

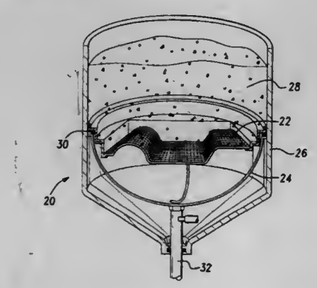
(c) immediately after passing the roller gap, deflecting the fiber-reinforced molded body in a discharge direction with the use of the cylinder rollers and discharging the body with the adhering substrates.

5,814,256

PROCESS OF PRODUCING PREFORMS CONTAINING LIGHT WEIGHT FILLER PARTICLES

Bruce Norman Greve, Clarkston, and Richard Freeman, Oxford, both of Mich., assignors to The Budd Company, Troy, Mich.

Filed Mar. 20, 1997, Ser. No. 822,079
Int. Cl.[6] D21J *7/00*
U.S. Cl. 264—86 **10 Claims**



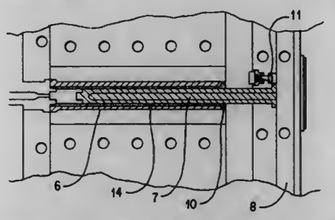
1. A method of producing and using composite fibers for use in a liquid molding process, said method comprising the steps of:
mixing filler particles with a base material such that a generally uniform mixture is produced, said filler particles having a lower material density than that of said base material;
forming said uniform mixture of said filler particles and said base material to form composite fibers;
placing a preform screen near the bottom of a tank filled with a liquid;
adding said composite fibers and a mass of reinforcing fibers to said liquid to form a slurry in said tank;
dispersing said composite fibers and said reinforcing fibers within said liquid thereby creating a substantially uniform slurry; and
processing said slurry to create a fiber preform upon said preform screen, wherein said reinforcing fibers and said composite fibers are generally blended and uniform throughout said fiber preform.

5,814,257

METHOD OF MANUFACTURING A CYLINDRICAL SUPPORTING MEMBER FOR ELECTROPHOTOGRAPHY

Noriaki Kawata, and Kiyoshi Hikima, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 305,907, Sep. 14, 1994, Pat. No. 5,512,399.
This application Jan. 16, 1996, Ser. No. 585,868
Claims priority, application Japan, Sep. 21, 1993, 5-233974
Int. Cl.[6] B29C *45/00*
U.S. Cl. 264—105 **7 Claims**



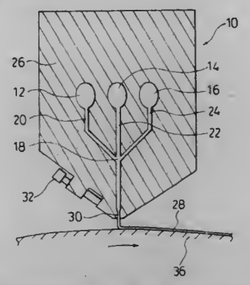
1. A method of manufacturing a cylindrical supporting member, comprising,
preparing a material of 10^4 ohm.cm or lower in volume resistivity by blending a cross-linking polyphenylenesulfide resin as a main component, an amount of said cross-linking polyphenylenesulfide resin being at least 40 wt % to provide dimensional accuracy; a highly conductive carbon black of 10^{-1} ohm.cm or less in volume resistivity, an amount of said carbon black being less than 20 wt % and an average particle diameter of said carbon black being 20 to 50 nm; and a carbon black dispersant in an amount of 10–30 wt %. said carbon black dispersant being selected from a group consisting of calcium carbonate and clay, and
injecting the material into a metal mold for a cylindrical supporting member.

5,814,258

METHOD FOR FORMING MULTILAYER SHEET OR MULTILAYER FILM

Shotaro Ogawa, and Kazuo Ozaki, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 24, 1996, Ser. No. 772,774
Claims priority, application Japan, Dec. 28, 1995, 7-342609; Jan. 24, 1996, 8-010335
Int. Cl.[6] B29C *47/06*
U.S. Cl. 264—173.12 **4 Claims**



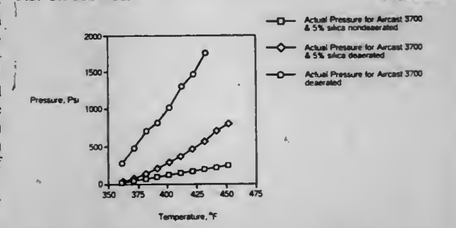
1. A method for forming at least one of a multilayer sheet and a multilayer film, comprising the steps of:
supplying melted resins to plural manifolds, said melted resins being joined at a confluence via passages for said melted resins;
piling said melted resins in plural layers at said confluence; and
extruding said melted resins from a slit to the outside so as to form said at least one of said multilayer sheet and said multilayer film;
wherein a flow rate of a resin forming a layer of layers composing said at least one of said multilayer sheet and said multilayer film is equal to or less than 1/25 of a total flow rate of resins forming other layers; and a ratio of melt viscosity of said resin forming said layer to melt viscosity of a resin forming another layer adjacent to said layer is adjusted to be equal to or more than 1.5 and equal to or less than 3, such that a thickness along a width of said layer is uniform.

5,814,259

METHOD FOR MOLDING STRUCTURAL PARTS UTILIZING MODIFIED SILICONE RUBBER

Erik S. Weiser, Santa Maria, Calif.; Robert M. Baucom, Newport News, and John J. Snoha, Hampton, both of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 292,621, Aug. 12, 1994, abandoned.
This application Mar. 25, 1997, Ser. No. 824,097
Int. Cl.[6] B29C *43/10*
U.S. Cl. 264—219 **8 Claims**



1. A method of molding structural parts, said method comprising:
a) providing a preform material for the structural part;
b) preparing a solid silicone rubber composition having entrained air voids to reduce the bulk modulus of the rubber such that a desired expansion rate of the rubber is obtained during a subsequent heating step, said preparation comprising:
(1) providing a liquid castable silicone rubber;
(2) adding a suitable amount of curing agent to the rubber;
(3) stirring in a sufficient quantity of inert additive to introduce discrete air voids into the rubber such that a desired reduction in the bulk modulus of the rubber is obtained; and
(4) curing the rubber;
c) positioning the preform material in a rigid mold having the desired shape of the structural part;
d) positioning a sufficient quantity of the silicone rubber in the rigid mold container such that the expansion of the silicone rubber during a subsequent heating will cause the preform material to be forced into intimate contact with the rigid mold container; and
e) heating the mold container to cause the silicone rubber to expand and to cure the preform material.

5,814,260

METHOD OF CASTING-MASKING-MOLDING THERMOPLASTIC RESIN PRODUCT

Takeshi Arai, 32-13-205, Sennari Mansion Hujimi 2-chome, Turugashima-shi, Saitama-ken, Japan

Filed Apr. 29, 1996, Ser. No. 639,621
Int. Cl.[6] B29C *35/02;39/12;71/02*
U.S. Cl. 264—245 **18 Claims**

1. A method of molding a thermoplastic resin product, comprising the steps of:

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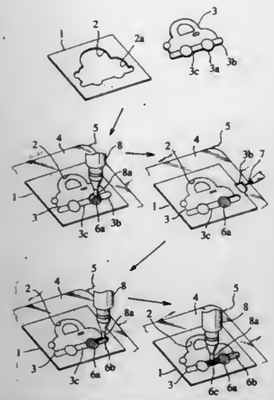


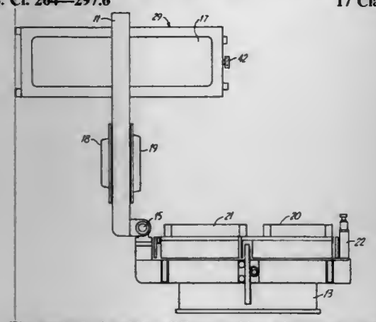
placing a molding sheet comprising a molding die and a mask on an upper surface of a heated table plate, said mask comprising a plurality of mask constituting pieces which are fitted into said molding die and capable of being separated from one another;

filling said molding die of said molding sheet by pouring a thermoplastic resin liquid of a desired color into a portion of said mask from which one of said mask constituting pieces is first taken out, then solidifying said poured thermoplastic resin liquid, and repeating for a required number of times the steps of pouring a thermoplastic resin liquid of a same color as said desired color or of another color different therefrom into another portion of said mask from which another of said mask constituting pieces is taken out, and then solidifying said poured thermoplastic resin liquid until a molded resin body is formed within said molding die of said molding sheet placed on said heated table plate; and

further heating said molded resin body, which is separated from said molding sheet, on said table plate and gelatinizing said molded resin body, and thereafter cooling said molded resin body to form said thermoplastic resin product.

5,814,261
MOLDING FIXTURES WITH INTERCHANGEABLE TOOLING PLATES

Joseph Steckling, St. Cloud, Minn., assignor to Dimension Industries, Inc., Maple Grove, Minn.
Filed Jul. 15, 1994, Ser. No. 275,838
Int. Cl.[6] B29C *33/30*
U.S. Cl. 264—297.6 **17 Claims**



1. The method of molding different refrigeration panels with the same fixture without having to remove and replace the tooling plates comprising the steps of:

placing a first tooling plate on one side of a platen and a second tooling plate on the opposite side of a pivotable pod;

aligning the first tooling plate with a frame by engaging an alignment pin between the pivotable pod and a support frame;

molding an article using the first tooling plate;

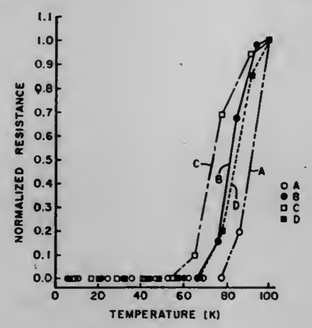
retracting the alignment pin to free the pivotable pod for rotation;

rotating the pivotable pod to bring the second tooling plate into a position for molding a second article; and

engaging the alignment pin between the pivotable pod and the support frame to permit molding a second article with the second tooling plate.

5,814,262
METHOD FOR PRODUCING THIN FLEXIBLE SINTERED STRUCTURES

Thomas D. Ketcham, Big Flats; Wayne B. Sanderson, deceased, late of Corning; by Stuart R. Sanderson, administrator, Tully; Dell J. St. Julien, Watkins Glen, and Kathleen A. Wexell, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.
Continuation of Ser. No. 664,295, Mar. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 393,532, Aug. 11, 1989, abandoned. This application Oct. 21, 1992, Ser. No. 964,002
Int. Cl.[6] B29C *33/58*
U.S. Cl. 264—316 **2 Claims**



1. A method for making a flexible inorganic sintered sheet or tape structure comprising the steps of:

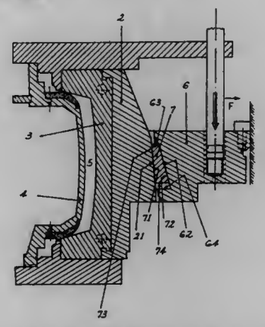
a) mixing an inorganic powder with one or more vehicle constituents to form a fluid batch;

b) forming the fluid batch on a fugitive polymer sheet support into an elongated green sheet or tape preform of aspect ratio greater than 2:1; and

c) sintering said green preform and support to vaporize the support without damage to the preform and to sinter the inorganic powder, thus to provide a flat sintered inorganic sheet or tape structure of sufficient strength and flexibility to survive bending in at least one direction to a radius of curvature not exceeding about 20 centimeters without breakage, wherein the step of sintering the elongated green preform comprises continuously transporting the elongated green preform through a hot zone maintained at a temperature above the sintering temperature of the inorganic powder.

5,814,263
TIRE MOLD WITH CONTROLLED INTERNAL PRESSURE

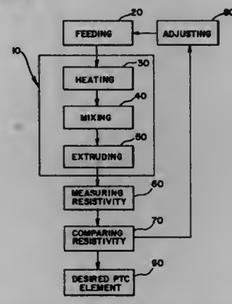
Guy Pouille, Clermont-Ferrand, and Bernard Ravel, Nohanent, both of France, assignors to Compagnie Generale des Etablissements Michelin-Michelin & Cie, France
Filed Sep. 19, 1996, Ser. No. 716,000
Claims priority, application France, Sep. 26, 1995, 95 11364
Int. Cl.[6] B29C *35/00*
U.S. Cl. 264—326 **12 Claims**



1. Mold for a tire or for an annular tread member of a tire, comprised of a multiplicity of sectors moving radially for the molding of the exterior of said tread member, the closing of said sectors being assured by the axial displacement of a crown coming to act on the frusto-conical seats of said sectors placed radially on the exterior, and, to permit retraction of the sectors from their position of closing in the mold, at least one annular element, positioned within a recess in said crown, which is comprised of a first support surface, frusto-conical, radially interior, intended to be applied at the time of the closing of the mold against the seats of the sectors with a wedging engagement and a second support surface, frusto-conical, radially exterior, intended to support the support of a corresponding surface of the crown with a non-wedging engagement, said crown resting with a controlled axial force.

5,814,264
CONTINUOUS MANUFACTURING METHODS FOR POSITIVE TEMPERATURE COEFFICIENT MATERIALS

Feng Cai, Lake in the Hills, and Tom J. Hall, Arlington Heights, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.
Filed Apr. 12, 1996, Ser. No. 631,478
Int. Cl.[6] H01B *1/20;* **B29C** *70/58;70/88*
U.S. Cl. 264—408 **26 Claims**



1. A continuous method for producing a conductive polymeric composition comprising the steps of:

providing a quantity of polymer component having a melting point temperature T_{mp} and a quantity of conductive filler component;

mixing the quantity of polymer component and the quantity of conductive filler component in a receiving unit at a temperature greater than T_{mp} to form a molten mixture;

forcing the molten mixture from the receiving unit to form a laminar sheet having a thickness of less than 0.02 inch and an electrical resistivity;

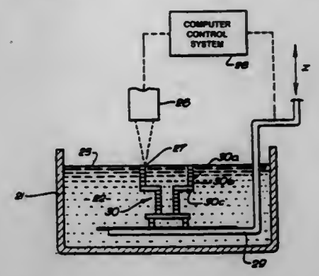
measuring the electrical resistivity of the laminar sheet;

comparing the measured electrical resistivity of the laminar sheet to a predetermined electrical resistivity value;

adjusting the quantity of conductive filler component relative to the quantity of polymer component based on the comparison between the measured electrical resistivity of the element and the predetermined electrical resistivity value to achieve a desired laminar sheet having a composition of about 35–70% by weight conductive filler component and about 30–65% by weight polymer component and an electrical resistivity at 25° C. of approximately less than 2 ohm cm.

5,814,265
METHOD AND APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Charles W. Hull, Arcadia, Calif., assignor to 3D Systems, Inc., Valencia, Calif.
Continuation of Ser. No. 299,878, Sep. 1, 1994, abandoned, which is a division of Ser. No. 967,303, Oct. 20, 1992, Pat. No. 5,344,298, which is a continuation of Ser. No. 749,125, Aug. 23, 1991, Pat. No. 5,174,943, which is a continuation of Ser. No. 637,999, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 493,498, Mar. 14, 1990, abandoned, which is a division of Ser. No. 340,894, Apr. 19, 1989, Pat. No. 4,929,402, which is a continuation of Ser. No. 161,346, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 792,979, Dec. 9, 1985, abandoned, which is a division of Ser. No. 638,905, Aug. 8, 1984, Pat. No. 4,575,330. This application Jun. 6, 1995, Ser. No. 469,046
Int. Cl.[6] B29C *35/08;41/02*
U.S. Cl. 264—401 **22 Claims**



4. A method of producing a three-dimensional object from a medium capable of solidification when subjected to a beam of synergistic stimulation, said method comprising the steps of:

providing said medium;

forming successive cross-sectional layers of structure of said object at a surface of said medium, said forming step including the step of forming a solid portion of at least one cross-sectional layer of structure by exposing said medium to said beam of synergistic stimulation along a plurality of spaced exposure paths wherein the spacing between the exposure paths is variably specifiable; and

adhering each succeeding cross-sectional layer of structure to a preceding cross-sectional layer of structure to produce said object.

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5,814,266

METHOD FOR IMPROVING CONSOLIDATION OF POWDER RESIN

David A. Pienkowski; Eric A. Grulke, and Robert J. Jacob, all of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed May 20, 1996, Ser. No. 650,605
Int. Cl.[6] B29B *9/10*
U.S. Cl. 264—443 **18 Claims**

1. A method for improving consolidation of powder resin, said method comprising the steps of:

sorting particles of said powder resin according to diameter of said particles;

combining said sorted particles having a first diameter D_1, with said sorted particles having a second diameter D_2 to form a particle mixture wherein $D_1>D_2$;

vibrating said particle mixture;

heating said particle mixture; and

delivering said particle mixture through a nozzle.

15. A method for improving consolidation of powder resin, said method comprising the steps of:

sorting particles of said powder resin according to diameter of said particles;

combining said sorted particles having a first diameter D_1 with said sorted particles having a second diameter D_2 to form a particle mixture wherein $D_1>D_2$; and

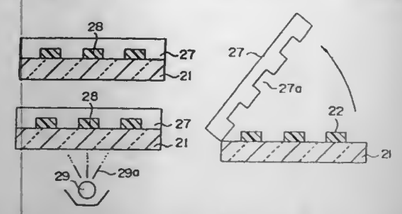
applying pressure to and heating said particle mixture sufficiently to achieve particle heating beyond the melting point of said powder resin.

5,814,267

METHOD OF FORMING THICK FILM PATTERN AND MATERIAL FOR FORMING THICK FILM PATTERN

Yorihiko Sakai; Norikatsu Ono; Norikazu Mineo; Takeshi Matsumoto, and Hideaki Fujii, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 762,008, Sep. 19, 1991, Pat. No. 5,580,511. This application Aug. 8, 1996, Ser. No. 694,025
Claims priority, application Japan, Jan. 25, 1990, 2-15431; Apr. 5, 1990, 2-90928; Dec. 25, 1990, 2-413682
Int. Cl.[6] C04B *37/00*
U.S. Cl. 264—496 **2 Claims**



1. In a method of forming a thick film pattern of ceramic material on a substrate, the method comprising the steps of:

forming a desirable pattern of ultraviolet curing resin on said substrate by photopolymerization to define a female mold having a desirable pattern with upwardly open spaces on said substrate, said ultraviolet curing resin being capable of vanishing;

filling said ceramic material in only the upwardly open spaces formed in said female mold; and

calcining to cause said female mold to vanish,

wherein the step of forming said desirable pattern of ultraviolet curing resin on said substrate by photopolymerization comprises the steps of:

filling ultraviolet curing resin in an original plate having grooves defining a desirable pattern;

placing said original plate on said substrate;

irradiating ultraviolet rays onto said ultraviolet curing resin from the backside of said substrate; and

removing said original plate from said substrate.

5,814,268

PROCESS OF MAKING A GOLF CLUB SHAFT

Jean-Marc Banchelin, Annecy Le Vieux; Philippe Renard, La Balme de Sillingy, and Serge Solviche, Cran Gevrier, all of France, assignors to Taylor Made Golf Company, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 427,252, Apr. 24, 1995, abandoned, which is a continuation-in-part of Ser. No. 35,316, May 11, 1993, abandoned, which is a continuation of Ser. No. 802,546, Dec. 5, 1991, abandoned. This application Dec. 23, 1996, Ser. No. 774,079
Claims priority, application France, Dec. 5, 1990, 90 15387
Int. Cl.[6] B29C *49/00;70/44*
U.S. Cl. 264—516 **10 Claims**

1. Process for the manufacture of a golf club shaft made of a composite material, said process comprising the successive steps of:

(a) producing an elongated, flexible impermeable bladder by dipping a template in a coagulating bath and then in a latex bath, said bladder having a first, open end and a second, closed end and a cross-section which decreases from adjacent said first end toward said second end, said bladder having a thickness of less than 1.0 mm and a length in excess of 1.0 meter;

(b) arranging said bladder around a rigid mandrel having a substantially conical shape identical with a shape of said template, and a length at least equal to a length of a shaft to be produced;

(c) preparing a continuous lay-up of fiber sheets having an orientation which depends on characteristics desired;

(d) dressing said mandrel with said lay-up of fiber sheets comprising fibers impregnated with an organic resin matrix to obtain a substantially frustoconical composite structure;

(e) placing said composite structure in a mold which has an impression which incorporates at least one area of enlargement or narrowing; and

(f) carrying out a molding operation by applying inside said bladder at least one internal pressure exerted by a fluid feed through said open end, so as to compress said composite structure against said impression of said mold and to produce a counterform of said at least one area on desired locations of said shaft.

5,814,269

PARISON TRANSPORTING DEVICE FOR BLOW MOLDING MACHINE

Albert Geiger, Garmisch-Partenkirchen, Germany, assignor to Verwaltungsgesellschsft Geiger Technik GmbH, Garmisch-Partenkirchen, Germany

Filed Jan. 11, 1996, Ser. No. 587,848
Claims priority, application Germany, Jan. 12, 1995, 195 00 696.8
Int. Cl.[6] B29C *49/04*
U.S. Cl. 264—542 **22 Claims**

12. A method for producing a hollow plastic article having a plurality of longitudinal axes comprising the steps of:

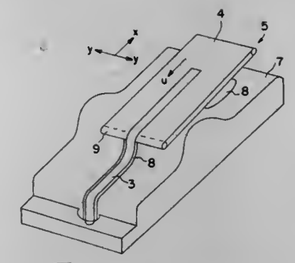
a) forming a heat-moldable tube from a tube forming head;

b) moving a conveyor belt carried on a conveyor system below said tube forming head and depositing said tube onto said conveyor belt;

c) moving said conveyor system into a position above a mold cavity of a blow mold such that an end section of said conveyor belt together with the tube located thereon is vertically positioned above an end section of said mold cavity;

d) rotating said conveyor belt;

e) moving said conveyor system simultaneously with rotation of the conveyor belt above said blow mold such that the tube has



a plurality of longitudinal axes conforming to the longitudinal axes of said hollow plastic article as the tube drops continuously into the mold cavity of said blow mold; and

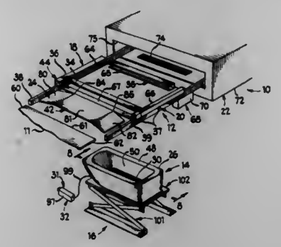
f) moving the conveyor system out of the area of said blow mold, whereupon said blow mold is closed and said tube is pressed against a wall of said mold cavity by introduction of a blow medium to form said hollow plastic article having a plurality of longitudinal axes.

5,814,270

APPARATUS AND METHOD FOR THE FORMATION OF A BATHTUB OR SHOWER STALL LINER

Mark Conrad Smith, Wood Dale, Ill., assignor to Luxury bath Liners, Inc., Bensenville, Ill.

Filed Mar. 19, 1996, Ser. No. 617,616
Int. Cl.[6] B29C *51/10*
U.S. Cl. 264—553 **13 Claims**



1. A method for making a bathtub or shower stall liner from a formable member comprising the steps of:

(a) retaining the formable member on a bathtub liner vacuum machine, the bathtub liner vacuum machine having means for retaining the formable member;

(b) attaching a portion of the formable member to a skirt forming member, the skirt forming member associated with the retaining means;

(c) heating the formable member to a desired elevated temperature so that the formable member becomes malleable;

(d) positioning the formable member into operative engagement with a plumbing apparatus so as to make a substantially air tight seal therebetween;

(e) evacuating the air from within the plumbing apparatus, to draw at least a portion of the formable member toward the plumbing apparatus to form the bathtub or shower stall liner;

(f) forming a skirt from the portion of the formable member while the portion of the formable member is attached to the skirt forming member; and

(g) removing the bathtub or shower stall liner from within the plumbing apparatus.

5,814,271

PROCESS OF PRODUCING FIBERS FROM CURABLE ALK-1-ENYL ETHER FUNCTIONAL SILOXANE RESINS

Duane Ray Bujalski, Auburn; Kai Su, Midaind, both of Mich., and Gregg Alan Zank, Tokyo, Japan, assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 707,120, Sep. 3, 1996, abandoned. This application Jul. 31, 1997, Ser. No. 903,553
Int. Cl.[6] C04B *35/56*
U.S. Cl. 264—625 **14 Claims**

1. A method for preparing a ceramic fiber comprising

(A) forming a fiber from an alk-1-enyl ether functional siloxane of the formula $(R^1SiO_{3/2})_q(R^2SiO_{3/2})_r(R^1_wR^2_xRSiO_{(3-w-x)/2})_s(R^1_wR^2_xR^3SiO_{(3-w-x)/2})_t$, wherein R is an alk-1-enyl ether group; each R^1 is selected from an aryl group having from 6 to 10 carbon atoms; each R^2 is selected from an alkyl group having from 1 to 4 carbon atoms; R^3 is an alkenyl group having from 2 to 10 carbon atoms; w has a value of 0, 1 or 2; x has a value of 0, 1, or 2 with the provisio that $w+x\leqq 2$; q has a value of 0 to 0.98; r has a value of 0 to 0.98; s is greater than zero; $t\geqq 0$; $s+t=0.02$ to 0.5 and $q+r+s+t=1$;

(B) curing the fiber of (A);

(C) heating the fiber of (B) in an inert environment to a temperature above about 800° C. to convert the fiber of (B) to a ceramic fiber.

5,814,272

METHOD FOR FORMING DENDRITIC METAL PARTICLES

Robert S. Zeller, Boston, and Christopher J. Vroman, Natick, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Feb. 21, 1996, Ser. No. 604,811
Int. Cl.[6] B29B *9/00*
U.S. Cl. 264—653 **20 Claims**

1. A method for forming dendritic particles, comprising the steps of:

(a) heating a powder comprising non-dendritic particles under conditions suitable for initial stage sintering, thereby forming a lightly sintered material; and

(b) breaking the lightly sintered material, thereby forming dendritic particles.

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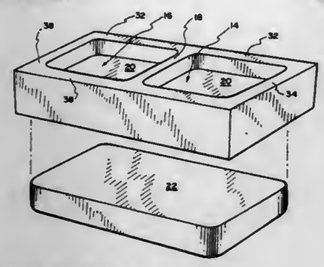
5,814,273
TRUNNION LINER APPARATUS
Jack T. Nielsen, 3330 S. 8000 West, Magna, Utah 84044
Filed Apr. 4, 1997, Ser. No. 835,152
Int. Cl.[6] B02C *17/14*
U.S. Cl. 266—168 16 Claims



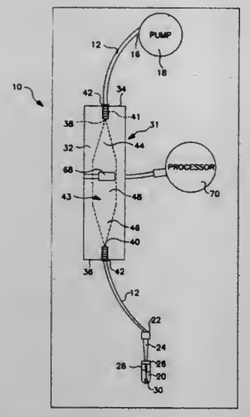
1. A trunnion liner apparatus, comprising:
a main body portion;
a main pocket formed in the main body portion;
a magnetic block held within the main cavity, the magnetic block being removably securable to a wall of a trunnion;
at least one cavity formed in the main body portion, the cavity retaining a bed of material which prevents wear on a trunnion surface.

5,814,274
LOW-CR FERRITIC STEELS AND LOW-CR FERRITIC CAST STEELS HAVING EXCELLENT HIGH TEPERATURE STRENGTH AND WELDABILITY
Nobuyoshi Komai; Fujimitsu Masuyama, both of Nagasaki-ken, and Tomomitsu Yokoyama, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1997, Ser. No. 803,595
Claims priority, application Japan, Jun. 24, 1996, 8-162790
Int. Cl.[6] C22C *38/44;38/48*
U.S. Cl. 420—106 24 Claims

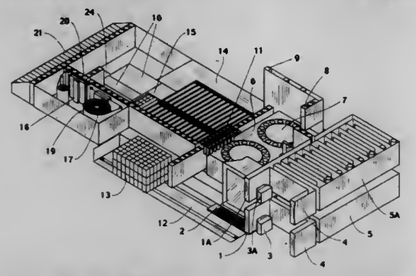
1. A low-Cr ferritic steel consisting essentially of, on a weight percentage basis, 0.03 to 0.12% C, 0.05 to 0.7% Si, 0.05 to 1% Mn, 0.002 to 0.025% P, 0.001 to 0.015%. S, 0.3 to 3% Cr, 0.01 to 1% Ni, 0.05 to 3% Mo, 0.01 to 0.5% V, 0.1 to 3% W, 0.01 to 0.2% Nb, 0.1 to 1.5% Re, 0.003 to 0.05% Al, 0.0001 to 0.01% B, 0.003 to 0.03%N, and the balance being Fe and incidental impurities.

5,814,275
OBSTRUCTION DETECTOR FOR A FLUID FLOW LINE OF A MEDICAL LABORATORY INSTRUMENT
Gregory D. Lewis, Cary; Dean Keiter, Durham, and Mario Moreno, Raleigh, all of N.C., assignors to Akzo Nobel N.V., Arnhem, Netherlands
PCT No. PCT/US95/02014, § 371 Date Dec. 12, 1996, § 102(e) Date Dec. 12, 1996, PCT Pub. No. WO95/22753, PCT Pub. Date Aug. 24, 1995
PCT Filed Feb. 15, 1995, Ser. No. 693,275
Int. Cl.[6] G01N *1/14*
U.S. Cl. 422—63 11 Claims

1. An apparatus for detecting obstructions of a flow line, comprising:
a flow line capable of allowing fluid to flow therethrough;
a pressure detector for detecting changes in pressure within said flow line, said pressure detector disposed on said flow line or sufficiently proximate to said flow line so as to be compressed when said flow line expands; and
a rigid barrier disposed proximate to said pressure detector on a side of said pressure detector opposite said flow line, said rigid barrier being sufficiently rigid so that when said flow line and pressure detector expand, said rigid barrier does not expand and said pressure detector is compressed.



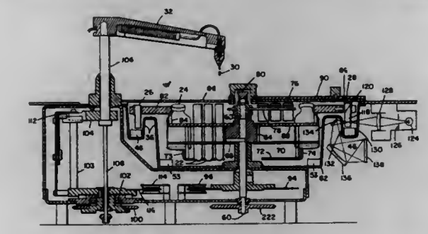
5,814,276
AUTOMATED BLOOD SAMPLE PROCESSING SYSTEM
Robert C. Riggs, 12901 N. MacArthur, #102, Oklahoma City, Okla. 73142
Filed Apr. 25, 1996, Ser. No. 637,541
Int. Cl.[6] G01N *35/02*
U.S. Cl. 422—65 14 Claims



1. An automated blood sample processing system comprising:
a primary test tube loading means in which primary test tubes having blood samples therein are loaded,
a conveyor system for moving test tubes, including primary and secondary test tubes, in selectable routes, said primary test tube loading means being connected to the conveyor system;
a centrifuge;
means for moving said primary test tubes from said conveyor system into said centrifuge wherein said primary test tubes are spun to separate serum from other blood components to provide spun samples and for moving primary test tubes after having been spun from said centrifuge back to said conveyor system;
a secondary test tube loading area in which empty secondary test tubes are loaded, said conveyor system being connected to the secondary test tube loading area;
a pipetting system into which primary test tubes and empty secondary test tubes are moved by said conveyor system;
means in said pipetting system to aliquot spun samples from each of said primary test tubes into a selected number of secondary test tubes;
a bar code printer having means for printing and attaching a bar code label to each of said secondary test tubes;

a capper system into which said secondary test tubes are moved by said conveyor system and in which caps are applied to said secondary test tubes; and
a sortation system into which said secondary test tubes are moved by said conveyor system and in which the secondary test tubes are sorted into separate slots in a sortation tray, the secondary test tubes being available for removal from the sortation tray slots for subsequent processing.

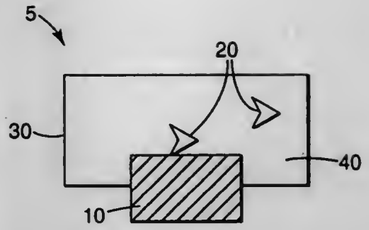
5,814,277
AUTOMATIC MULTIPLE-SAMPLE MULTIPLE-REAGENT CHEMICAL ANALYZER
Charles A. Bell, Weston; Warren J. Heath, Marlboro, and Norman M. Kleinman, Farmingham, all of Mass., assignors to Precision Systems, Inc., Natick, Mass.
Division of Ser. No. 404,168, Mar. 14, 1995, Pat. No. 5,597,733, which is a continuation of Ser. No. 93,576, Jul. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 807,772, Dec. 9, 1991, Pat. No. 5,229,074, which is a continuation of Ser. No. 224,059, Jul. 25, 1988, abandoned. This application Jan. 27, 1997, Ser. No. 788,213
Int. Cl.[6] G01N *35/10*
U.S. Cl. 422—67 4 Claims



1. An analyzer system comprising:
a plurality of containers for separately storing samples and reagent and test cells in which samples and reagent are to be dispensed;
a probe for drawing sample and reagent from respective containers and dispensing the sample and reagent in the test cells; and
electronic control which causes the probe to draw an amount of reagent sufficient for plural tests and to subsequently draw sample and dispense sample and reagent for plural tests by sequentially, for each test, drawing sample for an individual test and dispensing sample and reagent for the individual test without drawing additional reagent between tests.

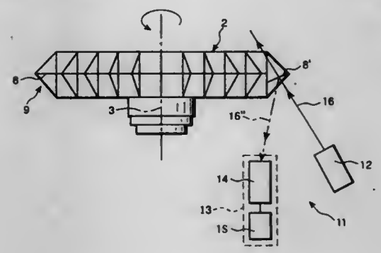
5,814,278
SHROUDED REACTION VESSEL
Anthony Robert Maistrovich, Woodbury, Minn.; James Alan Higgins, River Falls, Wis.; Wade Douglas Kretman, St. Paul, Minn.; Dennis Alan Davidson, Maplewood, Minn.; Katrina M. Jackson, Woodbury, Minn., and William Ross Berggren, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 26, 1996, Ser. No. 638,432
Int. Cl.[6] G05D *23/00;* B01J *10/00*
U.S. Cl. 422—109 33 Claims

1. A system that permits the safe use of a reaction vessel equipped with an ignition source to process flammable or combustible substances, comprising:
(a) a reaction vessel defining an internal reaction chamber free of any ignition sources;
(b) at least one ignition source in communicative proximity to said reaction vessel for measuring, controlling or effecting a processing parameter within the reaction chamber;



(c) at least one shroud externally connected to the reaction vessel and enclosing at least one ignition source within an isolation chamber defined between the shroud and the reaction vessel; and
(d) an inactive environment within said isolation chamber;
(e) wherein the reaction chamber and the isolation chamber are separate and independent chambers with mass transfer prohibited between the chambers.

5,814,279
CENTRIFUGE HAVING MARKER ELEMENTS
Wolfgang Biesel, Ottweiler; Stefan Kreber, Saarbrucken; Henning Brass, Homburg; Friedrich Witthaus, St. Wendel, and Artur Meisberger, St. Wendel, all of Germany, assignors to Fresenius AG, Homburg, Germany
Filed Feb. 2, 1996, Ser. No. 597,443
Claims priority, application Germany, Feb. 3, 1995, 195 03 534.8
Int. Cl.[6] G01N *21/07*
U.S. Cl. 422—72 7 Claims



1. A centrifuge comprising:
a drive unit;
a separation chamber selectively insertable into the drive unit as an exchangeable part and rotatable by the drive unit when so inserted, said separation chamber including a plurality of annularly disposed segments radially oriented with respect to an axis about which said chamber rotates;
a marker element serving as a reference position indicator for said chamber relative to said drive unit, said marker element being formed by arranging one of said segments in a plane which is inclined with respect to a common plane which others of said segments lie; and
a scanning device for detecting the position of the separation chamber, when rotated by the drive unit, by sensing the marker element.

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5,814,280

SEMICONDUCTOR PH SENSOR AND CIRCUIT AND METHOD OF MAKING SAME

Katsuhiko Tomita; Tsuyoshi Nakanishi; Syuji Takamatsu; Satoshi Nomura, and Hiroki Tanabe, all of Miyanohigashi-machi, Japan, assignors to Horiba, Ltd, Kyoto, Japan

Filed Nov. 21, 1996, Ser. No. 752,580

Claims priority, application Japan, Nov. 24, 1995, 7-329836; Oct. 11, 1996, 8-289370

Int. Cl.[6] G01N *21/00*

U.S. Cl. 422—82.01 19 Claims

1. A pH sensor of an ion-sensitive field-effect transistor comprising:

a crystalline substrate of silicon;

a thin film of aluminum oxide deposited on the substrate and having an epitaxial growth;

a thin film of silicon epitaxially grown on the aluminum oxide layer;

a source element provided on the thin silicon film;

a drain element provided on the thin silicon film; and

a pH responsive film layer connected to the source element and drain element.

5,814,281

RESISTIVE GAS SENSING

David Edward Williams, Abingdon; Ruth Ridley, London, and Eliot Sizeland, Gorleston-on-Sea, all of Great Britain, assignors to Capteur Sensor & Analysers, Ltd., Didcot, United Kingdom

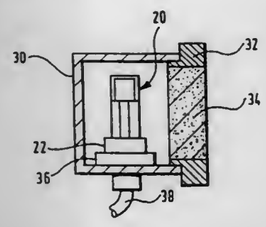
PCT No. PCT/GB95/00986, § 371 Date Oct. 28, 1996, § 102(e) Date Oct. 28, 1996, PCT Pub. No. WO95/30143, PCT Pub. Date Nov. 9, 1995

PCT Filed May 1, 1995, Ser. No. 732,271

Claims priority, application United Kingdom, Apr. 29, 1994, 9408542

Int. Cl.[6] G01N *30/64*

U.S. Cl. 422—88 19 Claims



1. A resistive gas sensor comprising a porous sensor body of a semiconducting oxide, a metallic phase decorating pore surfaces of said sensor body, said porous sensor body being formed of primary crystallites agglomerated together so as to exhibit a primary crystallite size and an agglomerate size, said agglomerate size being less than 10 times said primary crystallite size, said primary crystallite size having an average diameter of less than 5 micrometer, from 0.05 to 80% of said pore surfaces being covered by said metallic phase, said metallic phase consisting of particles having an average size of less than 50 nanometers wherein the sensor detects the concentration of a target gas in an atmosphere at a temperature of 110° C. or less.

5,814,282

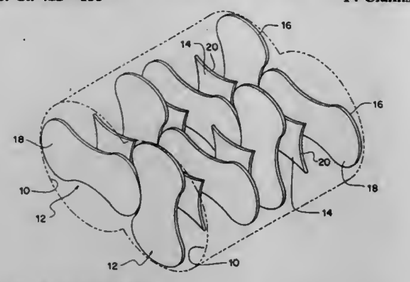
HIGH SURFACE INTERMESHING PROFILE REACTOR

Hans Lohe, Kiefernweg 18/D-61476, Kronberg; Hartmut Hey, Beethovenring 23/D-55283, Nierstein, both of Germany; Gordon Shaw, 6947 Candlewyck La., and W. Jeffrey Stikeleather, 6826 Windyrush Rd., both of Charlotte, N.C. 28226

Filed Jan. 15, 1997, Ser. No. 784,167

Int. Cl.[6] C08F *5/02;* B32B *19/02;* C08G *63/02*

U.S. Cl. 422—135 14 Claims



1. A reactor comprising:

a) a substantially horizontally extending chamber for polycondensation of a polymer, said chamber having interior surfaces including an inlet end and an outlet end;

b) at least one inlet at said inlet end of said chamber for introducing a low viscosity polymer into said chamber;

c) at least one outlet at said outlet end of said chamber, for discharging a high viscosity polymer from said chamber;

d) at least one outlet in said reactor communicating with said chamber for exhausting vapor;

e) at least two rotatable shafts, mounted in said chamber, substantially horizontally and extending the length of said chamber;

f) a plurality of stirrers mounted on each of said shafts;

g) a plurality of spacers for spacing apart each stirrer on each of said shafts such that said stirrers on one shaft intermesh with said stirrers on another shaft; and

whereby said stirrers are shaped so as to constantly wipe said interior surfaces of said chamber upon rotation of said shafts, as well as wipe said plurality of adjacent spacers, as well as wipe each adjacent intermeshed stirrer.

5,814,283

EXHAUST PURIFIER OF INTERNAL COMBUSTION ENGINE

Hiroki Matuoka; Masaaki Tanaka, both of Susono; Shigemitu Iisaka, Suntou-gun; Michio Furuhashi, Mishima; Toshinari Nagai, Suntou-gun; Tadayuki Nagai, Gotenba; Takashi Kawai; Kenji Harima, both of Susono, and Yuulchi Gotou, Susono-shi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

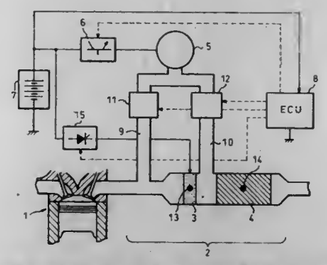
Filed Nov. 5, 1996, Ser. No. 744,229

Claims priority, application Japan, Nov. 9, 1995, 7-291389

Int. Cl.[6] F01N *3/22;* B01D *53/34;* G05D *7/00*

U.S. Cl. 422—172 14 Claims

1. An exhaust purifier for an internal combustion engine, the exhaust purifier comprising an electrically heated catalyst (EHC) disposed in an exhaust pipe, a main catalyst disposed in the exhaust pipe downstream of the EHC, means for determining whether the main catalyst and the EHC are active and means for supplying secondary air into the exhaust pipe, wherein, when it is determined that both the EHC and the main catalyst are active, the secondary air supply means supplies secondary air to a portion of the exhaust pipe upstream of the EHC and to a space in the exhaust pipe between the EHC and the main catalyst and, when it is determined that the EHC is active and the main catalyst is inactive, the secondary air supply means supplies secondary air only to the portion of the exhaust pipe upstream of the EHC and stops the



supply of secondary air to the space defined in the exhaust pipe between the EHC and the main catalyst, wherein a first quantity of air supplied by the secondary air supply means to the portion of the exhaust pipe upstream of the EHC is based on a quantity of air required to promote oxidation in the EHC and a second quantity of air supplied to the space in the exhaust pipe between the EHC and the main catalyst is based on a quantity of air required to promote oxidation in the main catalyst.

5,814,284

PLANT FOR THE REDUCTION OF NITROGEN OXIDE IN FURNACE WASTE GASES

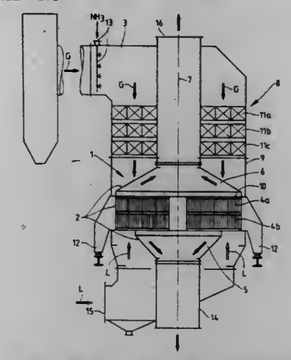
Siegfried Schlüter, Wenden-Rothemühle, Germany, assignor to Apparatebau Rothemuhle Brandt & Kritzler Gesellschaft mit beschrankter Haftung, Wenden-Rothemuhle, Germany

Continuation of Ser. No. 554,391, Nov. 6, 1995, abandoned, which is a continuation of Ser. No. 234,137, Apr. 28, 1994, abandoned. This application Mar. 13, 1997, Ser. No. 816,488

Claims priority, application Germany, Apr. 28, 1993, 43 13 861.6

Int. Cl.[6] B01D *53/34;* F01N *3/10*

U.S. Cl. 422—175 2 Claims



1. In a plant for the reduction of nitrogen oxide in furnace waste gases, the plant including a furnace, a reactor for a selective catalytic reduction, means for conducting waste gases in a waste gas flow from the furnace to the reactor, the reactor including at least one layer of catalyst cells, a regenerative heat exchanger mounted separately from the reactor, the regenerative heat exchanger adapted for use as one of an air preheater and a gas preheater for the treatment of the waste gases which contain pollutants, the regenerative heat exchanger having a housing containing at least one of stationary storage masses and revolving storage masses, said housing including an upper blade hood and a lower blade hood, and means for supplying a reduction agent to the waste gas flow in the conducting means in front of the at least one layer of catalyst cells, wherein the improvement comprises that the catalyst cells are mounted on a waste gas side above the upper blade hood of the heat exchanger housing in a reactor housing which is separate from the housing of the heat exchanger, that the reactor housing is mounted concentrically above the regenerative heat exchanger, and that the reactor housing is mounted on and supported by the housing of the heat exchanger, so that the reactor and the regenerative heat exchanger form a unit, the unit being supported by a common support frame placed on a foundation.

5,814,285

POISONING-PREVENTIVE LAYER-POSSESSING SUPPORT, POISONING-RESISTANT CATALYST, EXHAUST GAS CONVERTER DEVICE, AND POISONING-PREVENTIVE GASOLINE COMPOSITION

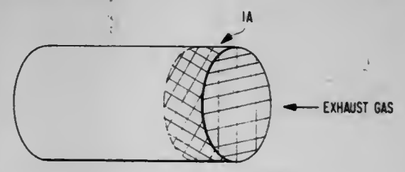
Takao Kojima; Ken Minoha, and Masaru Yamano, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Division of Ser. No. 340,434, Nov. 14, 1994, which is a continuation of Ser. No. 157,423, Nov. 26, 1993, abandoned, which is a continuation of Ser. No. 35,495, Mar. 19, 1993, Pat. No. 5,316,738, which is a continuation of Ser. No. 640,349, Jan. 11, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 478,844

Claims priority, application Japan, Jan. 12, 1990, 2-005672; Aug. 6, 1990, 2-208373

Int. Cl.[6] B01D *53/34;* F01N *3/10*

U.S. Cl. 422—177 6 Claims



1. A poisoning-preventive layer-possessing support comprising a distinct support and, formed thereon, a poisoning-preventive layer having a non-oxide compound containing at least one element selected from the Group IIa elements of the periodic table, wherein the compound is a chloride.

5,814,286

APPARATUS FOR SEPARATING SOLVENT IN A FEED OF SOLVENT AND DEASPHALTED OIL

Richard L. Hood, Edmond, Okla.; Philip B. Rettger, Walnut Creek, Calif., and Lucien Y. Bronicki, Yavne, Israel, assignors to Ormat Process Technologies, Inc., Israel

Filed Aug. 22, 1996, Ser. No. 701,477

Int. Cl.[6] B01D *17/02;11/04*

U.S. Cl. 422—256 21 Claims

1. Apparatus for separating solvent in a feed of lighter solvent and heavier deasphalted oil produced in a deasphalting process, said apparatus comprising:

a) a feed line for receiving said feed and constructed and arranged to produce a main stream of fluid containing supercritical solvent and deasphalted oil;

b) a substantially horizontally disposed inlet line for receiving said main stream, and constructed and arranged to produce at the outlet of said inlet line, two phase laminar flow of said stream such that the lighter supercritical solvent is substantially separate from and floats on the heavier deasphalted oil.

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5,814,287

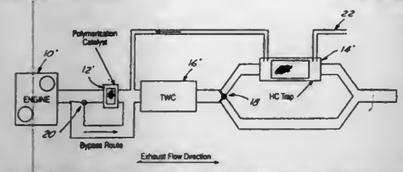
POLYMERIZATION CATALYST ENHANCED HYDROCARBON TRAPPING PROCESS

Andrew Anthony Adamczyk, Jr., Dearborn, Mich., and Anthony David Logan, Chandler, Ariz., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Continuation of Ser. No. 670,384, Jun. 25, 1996, abandoned, which is a continuation of Ser. No. 270,972, Jul. 5, 1994, abandoned. This application Nov. 13, 1997, Ser. No. 969,558

Int. Cl.[6] B01D *53/02;53/94;53/72*

U.S. Cl. 423—213.7 **6 Claims**



1. A method for polymerizing and subsequently trapping hydrocarbons generated during cold start of an internal combustion engine, the method comprising the steps of:

polymerizing said hydrocarbons by means of a polymerization catalyst located in an exhaust gas passage of said engine so as to form larger molecular weight hydrocarbon molecules from smaller molecular weight hydrocarbon molecules under conditions present in said exhaust gas;

trapping said larger molecular weight hydrocarbons on a hydrocarbon absorber located downstream of said polymerization catalyst in said passage and being selected from the group consisting of activated carbon, non-ion exchanged zeolite, silica gel, and alumina; and

locating an exhaust treatment catalyst in said passage to oxidize hydrocarbons;

said hydrocarbon polymerization catalyst being located between the engine and said exhaust treatment catalyst in said catalyst system.

5,814,288

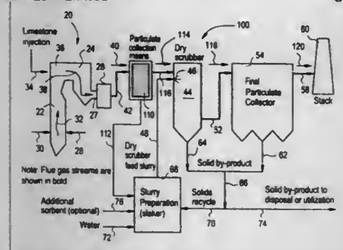
FLUE GAS DESULFURIZATION METHOD AND APPARATUS

Deborah A. Madden, Canfield, and George A. Farthing, Washington Township, both of Ohio, assignors to McDermott Technology, Inc., New Orleans, La.

Division of Ser. No. 611,605, Mar. 8, 1996. This application Jun. 26, 1996, Ser. No. 669,762

Int. Cl.[6] B01J *8/00*

U.S. Cl. 423—244.01 **8 Claims**



1. A method for desulfurizing and removing particulates from flue gas produced during a combustion process in a furnace of a steam generator to produce treated flue gas, comprising the steps of:

injecting limestone into an upper portion of a furnace in a temperature range of approximately 2000°–2400° F. to calcine a portion of the limestone into lime, some of the lime absorbing sulfur oxide species from a flue gas therein and producing calcium sulfate, the flue gas leaving the steam generator containing entrained particulates which are primarily fly ash calcium sulfate, and lime;

collecting particulates and thus a portion of the lime from the flue gas in first particulate collection means located downstream of the furnace and upstream of a dry scrubber means to reduce an amount of particulate entering the dry scrubber means which could otherwise be available to adsorb, absorb, or react with available water in the dry scrubber means, and maintain a higher free moisture content in particulates collected by a second particulate collection means located downstream of the dry scrubber means than would otherwise occur if the first particulate collection means was not present, to enhance removal of sulfur oxide species in the second particulate collection means;

slurrying the collected particulates and lime from the first particulate collection means with water to produce a dry scrubber feed slurry containing hydrated lime;

conveying the flue gas, from which the particulates and portion of the lime has been removed, to the dry scrubber means;

spraying the dry scrubber feed slurry into the flue gas within the dry scrubber means to further absorb sulfur oxide species from the flue gas therein by reaction with a portion of the lime and hydrated lime;

conveying the flue gas, lime and hydrated lime from the dry scrubber means to the second particulate collection means, where additional absorption of sulfur oxide species from the flue gas by reaction with the lime and hydrated lime occurs; and

collecting particulates from the flue gas in the second particulate collection means to produce treated flue gas.

5,814,289

PROCESS FOR THE PEPARATION OF COGRANULATES COMPRISING ALUMINOSILICATES AND SODIUM SILICATES

Alexander Tapper, Mönchengladbach 2; Günther Schimmel, Erftstadt-Gymnich; Gerd Wingefeld, Münstereifel-Eschweiler, and Hans-Peter Rieck, Hofheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 289,007, Aug. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 31,546, Mar. 15, 1993, abandoned. This application Jul. 30, 1996, Ser. No. 688,354

Claims priority, application Germany, Mar. 28, 1992, 42 10 253.7

Int. Cl.[6] C01B *33/26;* **C11D** *7/14*

U.S. Cl. 423—328.2 **1 Claim**

1. A process for the preparation of cogranulates having a bulk density of at least 700 g which easily disintegrate in water and consist essentially of aluminosilicates and crystalline sodium silicates having a layered structure which process comprises mixing the aluminosilicates and the crystalline sodium silicates having a layered structure in pulverulent form with one another; introducing the mixture into a zone in which it is compacted under pressure between two rolls rotating in opposite directions to form a compact; comminuting the compact; and finally separating off the desired particle sizes from the oversize and undersize material.

5,814,290

SILICON NITRIDE NANOWHISKERS AND METHOD OF MAKING SAME

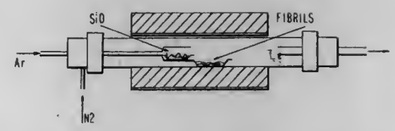
Chun-Ming Niu, Somerville, and David Moy, Winchester, both of Mass., assignors to Hyperion Catalysis International, Cambridge, Mass.

Filed Jul. 24, 1995, Ser. No. 506,250

Int. Cl.[6] C01B *21/068*

U.S. Cl. 423—344 **5 Claims**

1. A method for the production of nanowhiskers of primarily alpha-Si_3N_4 comprising the step of reacting components consisting



essentially of gaseous SiO, a source of nitrogen at elevated temperature and pressure and a plurality of carbon nanotubes having a diameter of from 3.5 to 70 nm in a reaction zone.

5,814,291

SIMPLIFIED SYNTHESIS OF ANION INTERCALATED HYDROTALCITES

Chandrashekhar P. Kelkar, Allegheny County, Pa., assignor to Aristech Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 684,371, Jul. 19, 1996, abandoned. This application May 14, 1997, Ser. No. 856,157

Int. Cl.[6] C01B *31/30*

U.S. Cl. 423—395 **10 Claims**

1. A method of making synthetic hydrotalcite-like material having at least one inorganic anion intercalated therein comprising the steps of:

(a) contacting an aluminum source with a magnesium source and at least one source of said inorganic anion, and in the absence of a Group IA metal source, at a temperature of at least about 40° C. to form a slurry, wherein said at least one source of said inorganic anion is an inorganic acid; and

(b) drying said slurry.

5,814,292

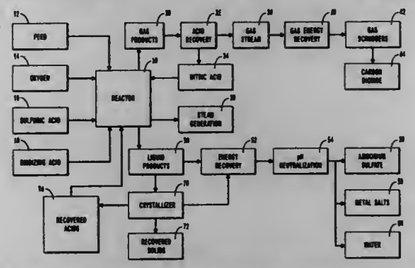
COMPREHENSIVE ENERGY PRODUCING METHODS FOR AQUEOUS PHASE OXIDATION

George G. Foster, and Frederick P. Kesler, both of Salt Lake City, Utah, assignors to Energy Research Group, Holladay, Utah

Filed Dec. 19, 1996, Ser. No. 770,646

Int. Cl.[6] C01C *1/242;* **C02F** *1/68;1/72*

U.S. Cl. 423—549 **46 Claims**



1. An aqueous phase oxidization process comprising:

(a) contacting a nonoxidized feed in a reactor with an oxidizing composition to yield a reaction mixture in which the feed is oxidized to produce final products, wherein the final products include gases which form pressure within the reactor such that the reaction mixture is maintained under pressure,

(i) wherein said oxidizing composition includes an oxidizing acid, a stabilizing acid, water and oxygen gas,

(ii) wherein said oxidizing acid includes nitric acid in an amount of at least about 3% by volume of nitric acid per volume of said reaction mixture,

(ii) wherein said stabilizing acid is included in said reaction mixture in an amount of at least about 5% and less than 40% by volume of said stabilizing acid per volume of said reaction mixture, and

(iv) wherein said oxygen gas is included in a sufficient quantity in said reaction mixture that, at a temperature of the reaction mixture, an increase in pressure is provided in said reactor beyond pressure resulting from any gases formed during the oxidation process and to ensure that a substantial portion of reduction products of nitric acid formed during oxidation of the feed are reoxidized to nitric acid primarily in the reactor;

(b) maintaining said reaction mixture at a temperature not greater than about 210° C.; and

(c) continually introducing and dispersing the oxygen gas in the reaction mixture.

5,814,293

CATALYST FOR THE SELECTIVE OXIDATION OF SULFUR COMPOUNDS TO ELEMENTAL SULFUR, PROCESS FOR PREPARING SUCH CATALYST AND PROCESS FOR THE SELECTIVE OXIDATION OF SULFUR COMPOUNDS TO ELEMENTAL SULFUR

Robert Johan Andreas Maria Terörde, Utrecht, and John Wilhelm Geus, Bilthoven, both of Netherlands, assignors to Gastec N.V., Apeldoorn, and Comprimo B.V., Amsterdam, both of Netherlands

PCT No. PCT/NL94/00226, § 371 Date Jun. 18, 1996, § 102(e) Date Jun. 18, 1996, PCT Pub. No. WO95/07856, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 16, 1994, Ser. No. 615,307

Claims priority, application Netherlands, Sep. 17, 1993, 9301615

Int. Cl.[6] C01B *17/04;* **B01J** *23/58*

U.S. Cl. 423—576 **18 Claims**

1. A support-based catalyst for the selective oxidation of sulfur-containing compounds to elemental sulfur, said catalyst comprising

a) a support material, containing at least one alkali metal promoter, which is thermostable and substantially inert to the Claus reaction; and

b) at least one catalytically active material applied to said support material containing at least one alkali metal promoter, said catalytically active material selected from the group consisting of iron compounds; and

a mixture of iron compounds and chromium compounds,

wherein the average pore radius of the catalyst is at least 25 Å, and the amount of said alkali metal promoter relative to the amount of said catalytically active material, both calculated as metal, is between 1 and 350 atomic percent.

14. A process for the selective oxidation of hydrogen sulfide to elemental sulfur, comprising the steps of passing a hydrogen sulfide-containing Claus tail gas, together with an oxygen-containing gas, over the catalyst according to claim 1 at a temperature of no greater than 330° C.

5,814,294

Patent Not Issued For This Number

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5,814,295

DETERMINATION OF LYMPH NODES ENRICHED IN TUMOR REACTIVE CELLS THEIR PROLIFERATION AND THEIR USE IN ADOPTIVE CELLULAR THERAPY

Edward W. Martin, Jr., Delaware, Ohio; Brian J. Czerniecki, Gaithersburg, Md.; Pierre L. Triozzi, and Julian A. Kim, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 93,088, Jul. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 866,839, Apr. 10, 1992, abandoned. This application Jul. 13, 1994, Ser. No. 271,902

Int. Cl.[6] A61K *51/00;* **G01N** *1/00*

U.S. Cl. 424—1.49 **48 Claims**

1. A method for determining lymph nodes enriched in tumor-specific lymphocytes comprising CD_4+ tumor-specific lymphocytes from those lymph nodes not so enriched, which comprises the steps of:

(a) administering to a human patient an effective amount of a photon-emitting radiolabelled locator which specifically binds a marker produced by or associated with neoplastic tissue;

(b) permitting time to elapse following step (a) for said radiolabelled locator to preferentially concentrate in any neoplastic tissue and for unbound radiolabelled locator to be cleared so as to increase the ratio of photon emissions from neoplastic tissue to background photon emissions in said patient;

(c) after said time has elapsed in step (b), accessing said patient with a radiation detection probe for determining lymph node sites exhibiting accretion of said radiolabelled locator by detecting with said probe elevated levels of radiation at said lymph node sites;

(d) removing lymph nodes at said sites determined in step (c);

(e) selecting those removed lymph nodes which visually do not contain evidence of tumor, wherein said selected lymph nodes are enriched in at least About 40% CD4+ tumor-specific lymphocytes; and

(f) culturing said lymph nodes selected in step (e) to proliferate tumor-specific lymphocytes therein.

5,814,296

Patent Not Issued For This Number

5,814,297

TECHNETIUM-99M LABELED PEPTIDES FOR IMAGING HAVING A SINGLE THIOL CONTAINING MOIETY

Richard T. Dean, Bedford; William McBride, Manchester, and Scott Buttram, Derry, all of N.H., assignors to Diatide, Inc., Londonderry, N.H.

Division of Ser. No. 807,062, Nov. 27, 1991, Pat. No. 5,443,815. This application Jun. 6, 1995, Ser. No. 471,741

Int. Cl.[6] A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **5 Claims**

1. A radioactively-labeled peptide for imaging a target site within a mammalian body, comprising:

a) a specific binding peptide having between 4 and 100 amino acid residues that concentrates at said target site;

b) a complexing group covalently linked to the specific binding peptide, said group comprising a single thiol moiety having a formula:

$$A\text{-}CH(B)\text{-}(C(RR'))_n\text{-}X$$

wherein

A is H or HOOC

B is H, SH or NHR", where R" is H or lower alkyl;

X is SH or NHR", where R" is H or lower alkyl;

R and R' are independently H or lower alkyl;

n is 0, 1,or2;

and where B is NHR", X is SH and n is 1 or 2;

where X is NHR", B is SH and n is 1 or 2;

where B is H, A is HOOC, X is SH and n is 0 or 1;

said group further comprising a dipeptide covalently linked to A when A is COOH, or to B when B is NH_2, or to X when X is NH_2; and

c) a radioactive isotope complexed to the complexing group.

5,814,298

RADIOACTIVELY LABELED SOMATOSTATIN-DERIVED PEPTIDES FOR IMAGING AND THERAPEUTIC USES

Richard T. Dean, and John Lister-James, both of Bedford, N.H., assignors to Diatide, Inc., Londonderry, N.H.

Division of Ser. No. 902,935, Jun. 23, 1992, Pat. No. 5,716,596. This application Jun. 6, 1995, Ser. No. 465,764

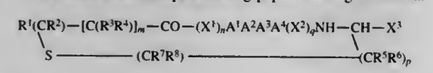
Int. Cl.[6] A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **4 Claims**

1. A kit for preparing a scintigraphic imaging agent, said kit comprising a sealed vial containing:

a) a predetermined quantity of a reagent comprising:

I) a somatostatin receptor-binding peptide having a formula:



wherein

R^1 and R^2 are independently H, lower alky or substituted alky, aryl, or substituted aryl;

R^3 and R^4 are each independently H, lower alkyl or substituted alkyl, aryl or substituted aryl, or either R^3 or R^4 are $N(R^{10})_2$, where each R^{10} is independently H, lower alkyl or a peptide sequence of no more than 10 amino acids, and m is an integer between 0 and 3;

X^1 and X^2 are each independently a D- or L- amino acid, and n and q are independently either 0 or 1;

A^1 is D- or L- Phe or D- or L-Tyr or a substituted derivative thereof;

A^2 is D- or L-Trp or a substituted derivative thereof;

A^3 is D- or L-Lys or a substituted derivative thereof;

A^4 is Thr, Ser, Val, Phe, Ile or Aib;

X^3 is H, —$COOR^9$, CH_2OH, CH_2COOR^9, or -$CON(R^9)_2$, where each R^9 is independently H, lower linear or cyclic alkyl or a substituted derivative thereof, or a peptide having an amino acid sequence of no more than 10 residues;

R^5 and R^6 each independently H or lower alkyl and p is either 0, 1, or 2; and

R^7 and R^8 are independently H, lower alkyl or substituted lower alkyl, or either R^7 or R^8 are —COOH or a derivative thereof; and

ii) a technetium-99m binding moiety covalently linked to said peptide; and

b) a sufficient amount of a reducing agent to label the reagent with technetium-99m.

5,814,299

RADIOLABELED GLUCANS COMPRISING A SINGLE THIOL CONTAINING MOIETY

Richard T. Dean, Bedford, N.H., assignor to Diatide, Inc., Londonderry, N.H.

PCT No. PCT/US94/08501, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO95/03836, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 28, 1994, Ser. No. 592,332

Int. Cl.[6] A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.73 **7 Claims**

1. A scintigraphic imaging agent comprising a β-glucan covalently linked to a radiolabel-binding moiety comprising a single thiol moiety having a formula:

$$A\text{—}CZ(B)\text{—}[C(R^1R^2)]_n\text{—}X$$

wherein A is H, HOOC, H^2NOC, (amino acid or peptide)—NHOC, (β-glucan) -(linker)-(peptide)—NHOC, (amino acid or peptide)—OOC, (β-glucan)-(linker)-(peptide)-OOC or R^4;

B is H, SH, —NHR^3, —$N(R^3)$-(peptide)-(linker)-(β-glucan), —$N(R^3)$ -(amino acid or peptide) or R^4;

X is H, SH, —NHR^3, —$N(R^3)$-(peptide)-(linker)-(β-glucan), —$N(R^3)$ -(amino acid or peptide) or R^4;

Z is H or R^4 ;

R^1, R^2, R^3 and R^4 are independently H or straight or branched chain or cyclic lower alkyl;

n is 0, 1 or 2; and

(1)where B is —NHR^3 or —$N(R^3)$-(peptide)-(linker)-(β-galucan), X is SH, and n is 1 or 2;

(2)where X is —NHR^3 or —$N(R^3)$-(peptide)-(linker)-(β-glucan), B is SH, and n is 1 or 2;

(3)where B is H or R^4, A is HOOC, H_2NOC, (β-glucan)-(linker) -(peptide)—NHOC or (β-glucan)-(linker)-(peptide)—OOC, X is SH, and n is 0 or 1;

(4)where A is H or R^4, then where B is SH, X is —NHR^3 or —$N(R^3)$ -(peptide)-(linker)-(β-glucan) and where X is SH, B is —NHR^3 or —$N(R^3)$ -(peptide)-(linker)-(β-glucan);

(5)where X is H or R^4, A is HOOC, H_2NOC, (β-glucan)-(linker) -(peptide)—NHOC, (β-glucan)-(linker)-(peptide)—OOC and B is SH; and

(6)where Z is methyl, X is methyl, A is HOOC, H_2NOC, (β-glucan) -(linker)-(peptide)—NHOC or (βglucan)-(linker)-(peptide)—OOC, B is SH and n is 0;

and wherein the radiolabel-binding moiety is attached to a radioisotope.

5,814,300

GENE-TARGETED NON-HUMAN MAMMALS DEFICIENT IN THE SOD-1 GENE

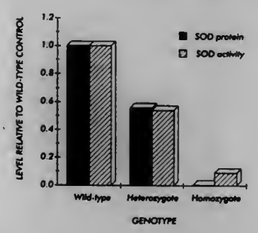
Richard W. Scott, Wallingford; Andrew G. Reaume, and Eric K. Hoffman, both of West Chester, all of Pa., assignors to Cephalon, Inc., West Chester, Pa.

Filed Mar. 3, 1995, Ser. No. 398,301

Int. Cl.[6] A61K *49/00;* **C12N** *15/09;* **G01N** *31/00;33/15*

U.S. Cl. 424—9.1 **4 Claims**

LEVELS OF SOD PROTEIN AND ACTIVITY IN MICE HETEROZYGOUS AND HOMOZYGOUS FOR THE SOD NULL ALLELE



1. A homozygous SOD-1 null mouse whose somatic and germ cells lack both SOD-1 alleles, said mouse prepared from an embryonic stem cell lacking at least one SOD-1 allelle following modification of said embryonic stem cell by homologous recombination, wherein said homozygous SOD-1 null mouse reaches sexual maturity and is able to propagate.

5,814,301

USE OF PROSTACYCLIN DERIVATIVES TO PREVENT OR TO TREAT DISORDERS OF THE MICROCIRCULATORY SYSTEM WHEN X-RAY, NMR OR ULTRASONIC CONTRAST MEDIA ARE ADMINISTERED

Rainer Klopp; Wolfgang Niemer; Wolfgang Schippel, and Werner Krause, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE92/00904, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO93/07875, PCT Pub. Date Apr. 29, 1993

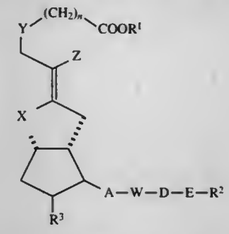
PCT Filed Oct. 22, 1992, Ser. No. 232,006

Claims priority, application Germany, Oct. 22, 1991, 41 35 193.2

Int. Cl.[6] A61K *31/557*

U.S. Cl. 424—9.3 **7 Claims**

1. A method for the prevention or treatment of disorders of the microcirculatory system occurring on administration of X-ray, NMR or ultrasonic contrast media, comprising administering, in conjunction with such contrast media, a compound of formula I



(I)

in which

R^1 means hydrogen or a C_1–C_4 alkyl radical,

n means 0 to 3,

X, Y, independently of one another, mean a —CH_2 group or an oxygen atom,

Z means hydrogen, fluorine or CN,

A means a trans —CH=CH— or a —C≡C group,

W means a hydroxymethylene group that is free or functionally modified on the hydroxy group, in which the hydroxy group can be in α- or β-position.

D means a straight-chain or branched, saturated C_1–C_5, alkylene group,

E means a —C≡C group,

R^2 means a C_1–C_2 alkyl group,

R^3 means a free or functionally modified hydroxy group, or if R^1 means hydrogen, a salt thereof with physiologically compatible bases, or a α-, β- or γ-cyclodextrin clathrate or a compound of formula I encapsulated with liposomes.

5,814,302

Patent Not Issued For This Number

5,814,303

DENTAL PRODUCT

David Robert Williams, Monroe, and Stephen Roy Barrow, Trumbull, both of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conocpo, Inc., Greenwich, Conn.

Filed Sep. 17, 1997, Ser. No. 932,412

Int. Cl.[6] A61K *7/16;7/18;7/20*

U.S. Cl. 424—57 **6 Claims**

1. A dental product comprising:

(i) a dispensing container with an upper and a lower body which are telescopically engageable one with another, the upper body including at least two hollow and separate parallel

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cylinders, the cylinders having a first generally closed end and a second end telescopically and slidingly accommodating at least two parallel pistons which conform to ride sealingly along the interior walls of the cylinders so as to force any flowable materials to flow toward the first end of the cylinder upon relative compression of the cylinders and pistons, the cylinders having outlet channels;

(ii) an outlet means in fluid communication with the outlet channels, the outlet means including adjacent outlet openings unconnected to each other and having means for causing the flowable materials to flow toward each other at the outlet openings to form a single, banded, unmixed stream;

(iii) a first semi-solid flowable material containing a peroxide and second semi-solid flowable material containing a bicarbonate salt, each of the first and second semi-solid materials otherwise having unmatched flow properties and being stored in separate ones of the at least two hollow parallel cylinders, at least one of the semi-solid materials containing from 0.05 to 20% of a polyphosphate effective to equalize the actuation forces, and to control viscosity of each semi-solid and to thereby achieve closer uniformity of extrusion between the two separate semi-solids.

5,814,304

STABLE AQUEOUS ABRASIVE PEROXIDE TOOTH WHITENING DENTIFRICE

Michael Wong, North Brunswick; Michael Prencipe, West Windsor, and Kedar N. Rustogi, Kendall Park, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 692,841, Aug. 2, 1996. This application Jul. 10, 1997, Ser. No. 891,010

Int. Cl.[6] A61K *7/16;7/20;33/40*

U.S. Cl. 424—53 **14 Claims**

1. An aqueous tooth whitening composition which is chemically stable and effects whitening and stain removal from teeth which comprises a vehicle containing water, a humectant, a calcined alumina abrasive, hydrogen peroxide, and about 0.05 to about 0.2% by weight of an antioxidant and about 0.1 to about 1% by weight of metal ion chelating agent.

5,814,305

USE OF HYDROPHILIC PENETRATION AGENTS IN DERMATOLOGICAL COMPOSITIONS FOR THE TREATMENT OF ONYCHOMYCOSES, AND CORRESPONDING COMPOSITIONS

Jean-Pierre Laugier, Antony; Marie-France Rude, Villejuif; Philippe Touzan, Ramonville Saint Agne, and François Rigenbach, Bagneux, all of France, assignors to Novartis AG, Basel, Switzerland

Continuation of Ser. No. 101,722, Aug. 4, 1993, abandoned, which is a continuation of Ser. No. 846,613, Mar. 5, 1992, abandoned. This application Jan. 30, 1995, Ser. No. 381,583

Claims priority, application France, Mar. 8, 1991, 91 02838

Int. Cl.[6] H61K *7/04;7/043*

U.S. Cl. 424—61 **11 Claims**

1. A method for treating onychomycoses which comprises the step of administering a topical preparation to the nail of a subject in need of such treatment, said topical preparation comprising a pharmaceutically-effective amount of terbinafine hydrochloride and a hydrophilic penetration agent in an amount effective to allow penetration of terbinafine hydrochloride into and through the keratinized ungual layer of the nail, said hydrophilic penetration agent being selected from the group consisting of glycols, glycol monoethers, glycol diethers, dimethylsulphoxide, caprolactam, dimethylisosorbide, isopropylidene glycerol, dimethylimidazolidinone, N-methyl pyrrolidone-2, pyrrolidone-2, ethyl lactate, polyoxyethylenated C_8–C_{10} glycerides, polyethylene glycol glyceryl laurate and dimethylacetamide.

5,814,306

Patent Not Issued For This Number

5,814,307

METHOD FOR REGULATING CELL GROWTH, LEUKOCYTE DIFFERENTIATION AND TUMOR CELL GROWTH USING ONCOSTATIN M TO STIMULATE SYNTHESIS OF IL-6

Philip M. Wallace, Seattle, and Thomas J. Brown, Poulsbo, both of Wash., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 129,230, Sep. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 504,486, Apr. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 335,399, Apr. 10, 1989, Pat. No. 5,202,116. This application Sep. 26, 1994, Ser. No. 312,205

Int. Cl.[6] A61K *38/18;* **C07K** *14/54*

U.S. Cl. 424—85.1 **4 Claims**

1. A method for regulating cell growth comprising contacting an individual's normal endothelial cells with an amount of Oncostatin M sufficient to induce the synthesis of IL-6 in an amount sufficient to regulate cell growth, wherein said regulated cell is not regulated by contact with Oncostatin M alone.

5,814,308

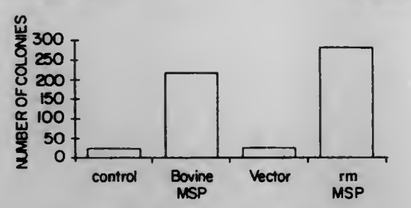
METHODS FOR THE TREATMENT OF GASTROINTESTINAL TRACT DISORDERS

Ke Zhang, 2146 Peak Pl., Thousand Oaks, Calif. 91362

Filed Mar. 26, 1996, Ser. No. 622,720

Int. Cl.[6] A61K *38/18;38/19;38/20;38/30*

U.S. Cl. 424—85.1 **10 Claims**



1. A method of treating disorders of the gastrointestinal tract lining in a mammal comprising administering a therapeutically effective amount of macrophage stimulating protein.

5,814,309

AEROSOL ANTIPERSPIRANT COMPOSITION

Maximo M. Panitch, Skokie, Ill., assignor to Helene Curtis, Inc., Chicago, Ill.

Filed Sep. 27, 1996, Ser. No. 721,831

Int. Cl.[6] A61K *7/32;7/00;7/38*

U.S. Cl. 424—651 **17 Claims**

1. A transparent aerosol antiperspirant composition comprising:

(a) about 1% to about 25% by weight of an active antiperspirant salt;

(b) about 30% to about 70% by weight of a carrier capable of solubilizing the active antiperspirant salt and having a solubility parameter value of about 11 to about 13, and said carrier comprising:

(i) about 15% to about 45% by weight of the composition of ethyl alcohol, and

(ii) about 15% to about 55% by weight of the composition of an organic solvent having a solubility parameter value of about 8.5 to about 13.5; and

(c) about 5% to about 32% by weight of a gas propellant comprising a liquified hydrocarbon or hydrocarbon blend.

5,814,310

MONOHYDRIC ALCOHOL-FREE COSMETIC STICK

Adrienne Nagy, Waldwick, N.J.; Joanne Leaver, Selden, N.Y.; Steven Messin, Plainview, N.Y., and Donna Meningall, Baldwin, N.Y., assignors to E-L Management Corp, New York, N.Y.

Filed Jan. 24, 1997, Ser. No. 788,140

Int. Cl.[6] A61K *7/32;7/06;7/00*

U.S. Cl. 424—65 **26 Claims**

1. A clear cosmetic stick composition comprising (a) from about 3–15% of a soap gelling agent; (b) from about 10–90% of at least one polyhydric alcohol solvent; and (c) from about 0.5–10% of a combination of the clarifying agents pentadoxynol 200 and ethoxylated jojoba esters.

5,814,311

COSMETIC COMPOSITION IN THE FORM OF A COMPACT POWDER AND PROCESS FOR PREPARING IT

Veronique Le Bras-Roulier, Paris, and Myriam Mellul, L'Hay-Les-Roses, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 22, 1995, Ser. No. 561,862

Claims priority, application France, Nov. 24, 1994, 94 14110

Int. Cl.[6] A61K *7/021*

U.S. Cl. 424—69 **33 Claims**

1. A composition which has been freeze-dried to form a compact powder comprising a fatty phase and a pulverulent phase, said pulverulent phase comprising a first incompactible filler and at least one second filler, which may be compactible or incompactible, said first and said second fillers being inorganic lamellar fillers, organic lamellar fillers, inorganic spherical fillers, or organic spherical fillers, said first and said second fillers being different types, and wherein the amount of incompactible fillers present in said composition is from about 2–10% relative to the total weight of the composition when said incompactible fillers have a density less than 0.1 g/cm^3, and from about 2–40% relative to the total weight of the composition when said incompactible fillers have a density of 0.1–0.5 g/cm^3, and from about 30–90% relative to the total weight of the composition when said incompactible fillers have a density greater than 0.5 g/cm^3.

5,814,312

COMPOSITION AND PROCESS FOR DEDUCING ODORS FROM ANIMAL DISCHARGES

Ronald C. Reich, Snellville, Ga., and Willow Zoè, Tacoma, Wash., assignors to Weaser, Inc., Highland Beach, Fla.

Continuation of Ser. No. 385,719, Feb. 8, 1995. This application Aug. 8, 1996, Ser. No. 694,196

Int. Cl.[6] A61L *11/00*

U.S. Cl. 424—76.6 **47 Claims**

1. A composition for reducing odors emanating from animal discharges consisting essentially of:

(a) water with a calcium carbonate content less than about 1000 ppm;

(b) chlorine dioxide in an amount effective to reduce odors emanating from animal discharges; and

(c) an acidulent in an amount sufficient to adjust the pH of the composition to a value greater than above 7.

5,814,313

THICKENED COSMETIC EMULSIONS

Craig Stephen Slavtcheff, Guilford, Conn.; Genaro Jaime Gonzalez, Jiutepec, Mexico, and Machitje Jerrey Mokati, Durban, South Africa, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Sep. 18, 1996, Ser. No. 715,661

Int. Cl.[6] A61K *31/74*

U.S. Cl. 424—78.03 **3 Claims**

1. A cosmetic emulsion composition comprising:

(i) from 1 to 90% by weight of water;

(ii) from 1 to 90% by weight of an oily cosmetic emollient selected from the grout of hydrocarbons, silicone oils, esters and combinations thereof, the esters being selected from the group consisting of triglycerides, Guerbet esters and combinations thereof;

(iii) from 0.1 to 20% by weight of an alpha-olefin modified polyether formed from the reaction of a copolymer of ethylene oxide and at least one lower C_3–C_4 alkylene oxide with a C_{12}–C_{40} alpha-olefin oxide or glycidyl ether; and

(iv) from 0.1 to 5% by weight of polyacrylamide.

5,814,314

NON-GLYCOSYLATED, RECOMBINANT HUMAN IL $_2$ IN REDUCED FORM

Danielle Lando, Paris; Philippe Riberon, Nogent Sur Marne, and Pierre Yves Abecassis, Paris, all of France, assignors to Roussel Uclaf, France

Continuation of Ser. No. 204,650, Mar. 1, 1994, abandoned, which is a continuation of Ser. No. 869,803, Apr. 16, 1992, abandoned, which is a continuation of Ser. No. 384,986, Jul. 24, 1989, abandoned. This application Feb. 12, 1996, Ser. No. 601,434

Claims priority, application France, Jul. 28, 1988, 88 10184

Int. Cl.[6] C07K *14/55;* **A61K** *38/20*

U.S. Cl. 424—85.2 **4 Claims**

1. Non-glycosylated, recombinant human IL-2 in reduced form, having a specific activity of at least 0.5×10^7 U/mg, and prepared by a process comprising the sequential steps of:

extracting IL-2 from inclusion bodies in a transformed microorganism by solubilization in a reducing medium with a chaotropic agent;

precipitating the IL-2;

resolubilizing and purifying the precipitated IL-2 on a reverse phase high performance liquid chromatography (HPLC) column with an acid eluant;

cooling the principal fraction from the HPLC to about −20° C. to form an aqueous phase and an organic phase;

recovering the aqueous phase and diluting the same in an acid medium;

purifying the IL-2 on a second reverse phase HPLC column in an acid medium; and

recovering the IL-2.

2. A composition comprising the purified IL-2 of claim 1, citric acid, mannitol, and an aqueous solvent.

5,814,315

METHODS FOR THE SUPPRESSION OF NEU MEDIATED PHENOTYPE IN TUMORS

Mien-Chie Hung; Di-Hua Yu; Angabin Matin, and Yujiao Joe Zhang, all of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 276,359, Jul. 15, 1994, Pat. No. 5,643,567, which is a continuation-in-part of Ser. No. 162,406, Dec. 3, 1993, Pat. No. 5,641,484, which is a continuation-in-part of Ser. No. 70,410, Jun. 4, 1993, Pat. No. 5,651,964, which is a continuation-in-part of Ser. No. 621,465, Dec. 4, 1990, abandoned. This application Jun. 1, 1995, Ser. No. 457,029

Int. Cl.[6] A61K *48/00;9/127;* **A01N** *63/00;* **C12N** *15/00*

U.S. Cl. 424—93.2 **32 Claims**

1. A method to suppress an oncogenic phenotype of a neu oncogene overexpressing cell in a mammalian tumor, comprising

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introducing to said tumor a nucleic acid encoding an adenoviral E1A gene product operatively linked to a promoter, wherein production of the E1A gene product results in a reduction of an oncogenic phenotype as indicated by a reduction in a transforming, tumorigenic, or metastatic potential of the cell.

5,814,316

COMPOUND TO MIMICK A NATURALLY OCCURRING PEPTIDE'S EFFECT

Mark E. Cook; Cheryl C. Miller, both of Madison, Wis., and Julio L. Pimentel, Buford, Ga., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 5, 1994, Ser. No. 286,113

Int. Cl.[6] A61K *39/395;39/40;39/42*

U.S. Cl. 424—139.1 **18 Claims**

1. A method of mimicking the physiological effects of choleocytokinin in an animal comprising:

administering an antibody to reverse choleocytokinin to said animal wherein said reverse choleocytokinin has an amino acid sequence which is the reverse sequence of choleocytokinin from the amino to the carboxyl ends.

5,814,317

STRUCTURAL ALTERATIONS OF THE EGF RECEPTOR GENE IN HUMAN GLIOMAS

Bert Vogelstein, Baltimore, Md., and Darell Bigner, Chapel Hill, N.C., assignors to The John Hopkins University, Baltimore, Md., and Duke University, Durham, N.C.

Division of Ser. No. 991,286, Dec. 15, 1992, Pat. No. 5,401,828, which is a division of Ser. No. 627,869, Dec. 17, 1990, Pat. No. 5,212,290, which is a division of Ser. No. 531,410, Jun. 1, 1990, abandoned, which is a continuation-in-part of Ser. No. 404,226, Sep. 8, 1989, abandoned. This application Mar. 28, 1995, Ser. No. 411,567

Int. Cl.[6] A61K *39/395;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 424—143.1 **10 Claims**

1. A method of treating glioma in a patient which comprises:

administering to a patient with a glioma a therapeutically effective amount of an antibody coupled to a therapeutic agent, said antibody specifically binding to an EGFR mutant protein type II but not specifically binding to an intact EGFR protein.

9. A method of treating glioma in a patient which comprises:

administering to a patient with a glioma an antibody, said antibody specifically binding to an EGFR mutant protein type II but not specifically binding to an intact EGFR protein.

5,814,318

TRANSGENIC NON-HUMAN ANIMALS FOR PRODUCING HETEROLOGOUS ANTIBODIES

Nils Lonberg, and Robert M. Kay, both of San Francisco, Calif., assignors to GenPharm International Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 53,131, Apr. 26, 1993, Pat. No. 5,661,016, which is a continuation-in-part of Ser. No. 990,860, Dec. 16, 1992, Pat. No. 5,545,806, which is a continuation-in-part of Ser. No. 904,068, Jun. 23, 1992, which is a continuation-in-part of Ser. No. 853,408, Mar. 18, 1992, which is a continuation-in-part of Ser. No. 810,279, Dec. 17, 1991, Pat. No. 5,569,825, which is a continuation-in-part of Ser. No. 575,962, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 574,748, Aug. 29, 1990, abandoned. This application Jul. 22, 1993, Ser. No. 96,762

Int. Cl.[6] C12N *15/00;* **A61K** *39/00;* **C07K** *16/00;* **C07H** *21/04*

U.S. Cl. 424—184.1 **10 Claims**

1. A method for producing a secondary repertoire antibody that is reactive with a predetermined antigen, said method comprising the steps of:

(a) immunizing a transgenic mouse with the predetermined antigen, the transgenic mouse having a genome comprising a homozygous functionally disrupted endogenous heavy chain locus and an unrearranged human heavy chain immunoglobulin transgene having V, D, and J gene segments in operable cis linkage to μ and γ switch recombination sequences and associated human μ and γ constant regions;

(b) obtaining B cells from said immunized transgenic mouse expressing said secondary repertoire antibody reactive with said predetermined antigen, said antibody having a human γ heavy chain encoded by joined V, D, and J gene segments from the unrearranged transgene in cis linkage to a recombined switch sequence and a γ constant region gene segment from the human constant regions in the transgene, the recombined switch sequence having sequences from the μ and γ switch recombination sequences;

(c) obtaining, from said B cells, variable region sequences of the human heavy chain; and

(d) expressing, in an immortalized host cell, said antibody having the variable region sequences.

5,814,319

ANTI-VIRAL, ANTI-BACTERIAL AND ANTI-CANCER AGENT

Masatoshi Nakano, Chiryu, Japan, assignor to Mitsui Norin Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1996, Ser. No. 621,825

Int. Cl.[6] A01N *65/00*

U.S. Cl. 424—195.1 **5 Claims**

1. An anti-viral, anti-bacterial and anti-cancer composition comprising an anti-viral, anti-bacterial or anti-cancer effective amount of an alkaline extract of *Aspalathus linearis* as an active component together with a pharmaceutically acceptable carrier, wherein the extract is obtained by contacting water at a temperature of 70° to 100° C. with leaves, stems or roots of *Aspalathus linearis* and drying the leaves, stems or roots and then contacting the dried leaves, stems or roots with a solution containing at least one alkaline compound.

5,814,320

***EIMERIA TENELLA* POLYPEPTIDE AND VACCINE CONTAINING SAME**

Lorraine Elizabeth Clarke, Cumnor; Fiona Margaret Tomley, Cambridge, both of United Kingdom; Rein Dijkema, ML Oss, and Arno Vermeulen, HH Cuyk, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Division of Ser. No. 500,162, Mar. 27, 1990, Pat. No. 5,677,438. This application Jun. 7, 1995, Ser. No. 473,468

Claims priority, application European Pat. Off., Mar. 28, 1989, 89303032

Int. Cl.[6] A61K *39/00;39/012;* **C12P** *21/06*

U.S. Cl. 424—267.1 **5 Claims**

1. An isolated protein which is an *Eimeria tenella* antigen, wherein said protein has an apparent molecular weight of about 100±10 kD in SDS-PAGE and binds to monoclonal antibody Et11P-2 under non-reducing conditions but not under reducing conditions and occurs in the sporulated oocyst, sporocyst, sporozoite, first and second generation schizonts and second generation merozoite of *Eimeria tenella*.

5,814,321

OIL ADJUVANT VACCINE AND METHOD FOR PREPARING SAME

Tokuji Miyahara; Kozo Takase, both of Kumamoto-ken; Koichi Saito, Amagasaki; Yoko Kishimoto, Akashi, and Satoru Tokuyama, Nishinomiya, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, and NOF Corporation, Tokyo, both of Japan

Filed Nov. 29, 1996, Ser. No. 758,374

Claims priority, application Japan, Nov. 30, 1995, 7-311964; Nov. 30, 1995, 7-311965

Int. Cl.[6] A61K *45/00;9/107*

U.S. Cl. 424—278.1 **9 Claims**

1. A water-in-oil type oil adjuvant vaccine comprising 20 to 90% by weight of an oil phase A) which is in a liquid state at ordinary temperature; 0.5 to 30% by weight of an emulsifying agent comprising a non-ionic surfactant B) which is a partial ester derived from a polyhydric alcohol carrying at least three hydroxyl groups and a fatty acid and which is in a liquid state at 40° C. and a hydroxy fatty acid triglyceride C) wherein a hydroxy group of the fatty acid is polyoxyethylenated with 20 to 60 ethylene oxide units; E) 0.01 to 10% by weight of an amino acid or a salt thereof and 0.01 to 10% by weight of a non-reducing sugar or a sugar alcohol having at least 5 hydroxyl groups in the molecule; and 5 to 75% by weight of an aqueous phase D) containing a biologically acceptable and effective amount of antigens.

5,814,322

GELLED COSMETIC AND/OR DERMATOLOGICAL COMPOSITION WHICH IS RICH IN SOLVENT AND WHICH CONTAINS HOLLOW PARTICLES, AND ITS APPLICATIONS

Laurence Sebillotte-Arnaud, Creteil, France, assignor to L'Oreal, Paris, France

Filed Jul. 11, 1995, Ser. No. 499,916

Claims priority, application France, Jul. 11, 1994, 94 08568

Int. Cl.[6] A61K *7/02;7/48*

U.S. Cl. 424—401 **22 Claims**

1. A cosmetic and/or dermatological composition having a homogeneous appearance comprising a hydrophilic medium, at least one gelling agent, and hollow particles having a density of up to 200 kg/m^3, wherein said medium comprises at least 20% by weight of an organic solvent, based on the total weight of said composition, and less than 50% by weight of water, based on the total weight of said composition.

5,814,323

COSMETIC COMPOSITION

Ian Gardner Lyle, Flintshire, United Kingdom, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 15, 1996, Ser. No. 720,999

Claims priority, application United Kingdom, Oct. 16, 1995, 9521125

Int. Cl.[6] A61K *7/00*

U.S. Cl. 424—401 **2 Claims**

1. A process for reversibly applying a cosmetic composition to the skin comprising the steps:

(a) first contacting the skin or hair with the cosmetic composition, the composition comprising; (i) at least one amphiphilic material which is capable of forming a water-insoluble liquid crystal phase of greater than one-dimensional periodicity when said composition is applied to the skin; and (ii) a cosmetic agent; and

(b) subsequently removing the cosmetic composition by applying to the skin or hair a cleansing composition comprising a surface active agent and a hydrotrope capable of destroying the liquid crystal phase formed in step (a).

5,814,324

INJECTABLE COMPOSITION AND A METHOD OF PRODUCING THE SAME

Jun Sato, Kawanishi; Akiko Watanabe, Kobe, and Susumu Iwasa, Tsuzuki-gun, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP95/00260, § 371 Date Jun. 13, 1995, § 102(e) Date Jun. 13, 1995, PCT Pub. No. WO95/22973, PCT Pub. Date Mar. 8, 1995

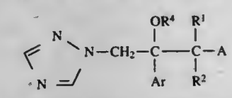
PCT Filed Feb. 23, 1995, Ser. No. 454,151

Claims priority, application Japan, Feb. 25, 1994, 6-028474

Int. Cl.[6] A01N *25/04;* **A61K** *31/41;* **B01J** *13/00*

U.S. Cl. 424—405 **13 Claims**

1. An injectable oil-in-water emulsion composition for intravenous administration which comprises an oil component, an emulsifier and an antifungal triazole compound of the formula (I)



(I)

wherein Ar represents a substituted phenyl group;

R^1 and R^2 represent, independently, a hydrogen atom or a lower alkyl group, or R^1 and R^2 may together form a lower alkylene group; R^4 represents a hydrogen atom or an acyl group; and A represents an optionally substituted cyclic amide group bonded through a nitrogen atom, or

a salt thereof,

wherein said triazole compound is dissolved in said oil-in-water emulsion in a proportion of 0.0001 to 2% (W/V),

wherein the oil component of said oil-in-water emulsion is a triglyceride of medium-size chain fatty acids having 6 to 14 carbon atoms, the amount of said oil component being 2 to 25% by weight, and

wherein the emulsifier is lecithin, the amount of said emulsifier being 0.5 to 5% (W/V) and the proportion of said emulsifier relative to the total weight of the oil component being 1.0 to 15% by weight.

5,814,325

PROCESS FOR REPELLING AND KILLING INSECTS AND COMPOSITIONS TO EFFECT THE SAME COMPRISING A MONOTERPENE

Robert L. Rod, Marina del Rey, Calif., assignor to The Rod Family Trust, Marina del Rey, Calif.

Division of Ser. No. 437,539, May 9, 1995, Pat. No. 5,653,991, which is a continuation-in-part of Ser. No. 036,363, Mar. 24, 1993, abandoned. This application Apr. 11, 1997, Ser. No. 838,741

Int. Cl.[6] A01N *25/24*

U.S. Cl. 424—407 **14 Claims**

1. A process for repelling insects attracted to a locus by an odor emitted from the locus comprising:

wetting the locus with an effective amount of a solution of a terpene of the formula $C_{10}H_{16}$ and a slow evaporating white mineral oil to mask the odor emitted from the locus,

said slow evaporating white mineral oil having a distillation initial boiling point of at least 360° F., an end point of 600° F. and above and a flash point of from 245° F. to 590° F.,

said terpene being present in an amount of 0.1 to 50% by weight, based on the total weight of said solution.

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5,814,326

INSECT COMMUNICATION DISTURBING MATERIAL

Shuji Senda, and Takeshi Saika, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Nov. 3, 1995, Ser. No. 553,100

Claims priority, application Japan, Nov. 4, 1994, 6-270997; Nov. 4, 1994, 6-270998

Int. Cl.[6] A01N *25/34*

U.S. Cl. 424—411 6 Claims

1. A method for disturbing insect communication which comprises attracting male adult insects to an insect communication disturbing material, thereby effecting contact of the male adults with said insect communication disturbing material and adhesion of a pheromone component to the body of the males, and subsequently allowing the contacted males to be free without capturing them, wherein the insect communication disturbing material comprises:

(A) a covering material having an exudable pheromone component included therein, and

(B) an ultra-thin layer of about 0.1 to 10 μm in thickness of exuded pheromone component on at least one surface of said covering material,

wherein the exuded pheromone component is transferable and adherable to insect pests which contact the insect communication disturbing material, and

wherein the insect communication disturbing material does not contain insecticide.

5,814,327

SHEETS FOR ANIMALS, SHEET, BAGS, DAILY GOODS, INK AND PACKAGING MATERIALS

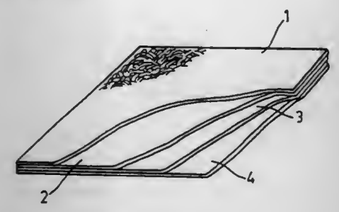
Hiroshi Ito, Tokyo; Kaoru Shinpo, Saitama, and Yasuharu Kiritani, Tokyo, all of Japan, assignors to Daiki Co., Ltd., Japan

Division of Ser. No. 608,283, Feb. 28, 1996, Pat. No. 5,595,754, which is a continuation of Ser. No. 271,124, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 752,466, Aug. 23, 1991, abandoned. This application Sep. 17, 1996, Ser. No. 714,842

Claims priority, application Japan, Dec. 25, 1989, 1-335965; Jan. 25, 1990, 2-15592; Apr. 24, 1990, 2-108190; May 7, 1990, 2-117113; Jun. 11, 1990, 2-152367; Jul. 25, 1990, 2-197061; Aug. 31, 1990, 2-231888

Int. Cl.[6] A01K *29/00;25/34*

U.S. Cl. 424—414 1 Claim



1. A toilet sand animals comprising cellulose and cellulose derivatives impregnated with a color-developing component containing bromothymol blue and a sterilizing agent selected from the group consisting of ethanol and DL-pyrrolidone carboxylate, said bromothymol blue and sterilizing agent are dispersed in toluene as organic solvent.

5,814,328

PREPARATION OF COLLAGEN USING PAPAIN AND A REDUCING AGENT

Subramanian Gunasekaran, 5686 Geranium Ct., Newark, Calif. 94560

Filed Jan. 13, 1997, Ser. No. 782,138

Int. Cl.[6] A61F *2/00;* A61K *38/17;* C12P *21/06;* C07K *1/14*

U.S. Cl. 424—426 16 Claims

1. A method for purifying collagen comprising:

a) providing:

i) a sample comprising collagen,

ii) first and second proteolytic enzyme preparations, wherein both said first and second proteolytic enzyme preparations comprise papain, and

iii) a reducing agent, wherein said reducing agent is selected from the group consisting of sodium sulfide, dithiothreitol, glutathionine, and sodium borohydride;

b) exposing said collagen sample to said first proteolytic enzyme preparation comprising papain to produce a first collagen solution;

c) exposing said first collagen solution to said reducing agent to produce a second collagen solution; and

d) exposing said second collagen solution to said second proteolytic enzyme preparation comprising papain to produce purified collagen.

5,814,329

HYDROPHILIC POLYSTYRENE GRAFT COPOLYMER VEHICLE FOR INTRAVAGINAL ADMINISTRATION OF PHARMACOLOGICALLY ACTIVE AGENTS

Kishore R. Shah, Bridgewater, N.J., assignor to Polytherapeutics, Inc., Bridgewater, N.J.

Filed Nov. 12, 1996, Ser. No. 746,327

Int. Cl.[6] A61K *47/32;9/02*

U.S. Cl. 424—433 32 Claims

1. A sustained release vaginal dosage form comprising:

(A) a drug or a plurality of drugs to be delivered, and

(B) a drug delivery vehicle consisting essentially of a thermoplastic graft copolymer, said graft copolymer being a reaction product of:

(1) a polystyrene macromonomer having an ethylenically unsaturated functional group, and

(2) at least one hydrophilic acidic monomer having an ethylenically unsaturated functional group;

wherein the weight percent of the polystyrene macromonomer in the graft copolymer is between about 1 and about 20%, and the weight percent of the total hydrophilic monomer in the graft copolymer is between 80 and 99%, wherein at least about 10% of said total hydrophilic monomer is acidic, said graft copolymer when fully hydrated having an equilibrium water content of at least 90%,

said graft copolymer being present in said dosage form in an amount sufficient to cause said dosage form to form a water swollen but insoluble jelly like mass upon contact with the biological environment.

5,814,330

MUCOADHESIVE EMULSIONS CONTAINING CYCLODEXTRIN

Peter Putteman, Schellebelle; Marc Karel Jozef François, Kalmthout, and Eric Carolus Leonarda Snoeckx, Beerse, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

PCT No. PCT/EP95/01760, § 371 Date Oct. 31, 1996, § 102(e) Date Oct. 31, 1996, PCT Pub. No. WO95/31178, PCT Pub. Date Nov. 23, 1995

PCT Filed May 10, 1995, Ser. No. 732,262

Claims priority, application European Pat. Off., May 18, 1994, 94201402

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—434 10 Claims

1. A mucoadhesive emulsion composition comprising, a drug selected from the group consisting of antibacterial, antiviral, contraceptive, and antifungal agents, and a cyclodextrin or a derivative thereof in an amount from 10% to 70% by weight based on the total weight of the composition.

5,814,331

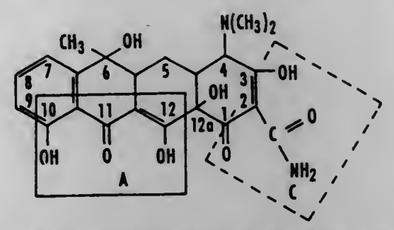
PROCESS FOR INHIBITING PATHOGENTIC BACTERIA IN THE ORAL CAVITY AND FOR BINDING PEPTIDE GROWTH FACTORS ON SURFACES

Sheldon Holen, 2928 Macomb St. NW., Washington, D.C. 20008

Filed Nov. 13, 1995, Ser. No. 542,588

Int. Cl.[6] A61K *6/00;31/65*

U.S. Cl. 424—435 9 Claims



1. A process for inhibiting bacterial growth in the oral cavity by occupying bacterial growth sites comprising the steps of:

selecting a surface within the oral cavity or on a substrate to be introduced into the oral cavity said surface being a member selected from the group consisting of teeth, crowns, pontics, connectors screws titanium or hydroxyapatite coated titanium implants or polytetrafluoroethylene membranes: providing the surfactant, tridodecylemthylammonium chloride in solvent in about a 5% solution and applying said surfactant to said surface and subsequently applying a solution of the therapeutic agent tetracycline, at a pH of at least 9.3 to said surfactant coated surface wherein bound tetracycline is retained in an environment similar to the oral cavity.

5,814,332

PROCEDURE FOR ENCAPSULATING IBUPROFEN

Sambasiva Rao Ghanta, Centerville, and Robert Edmon Guisinger, Dayton, both of Ohio, assignors to Eurand America, Inc., Vandalia, Ohio

Division of Ser. No. 483,909, Jun. 7, 1995, Pat. No. 5,653,993, which is a continuation of Ser. No. 106,024, Aug. 13, 1993. This application Feb. 20, 1997, Ser. No. 804,091

Int. Cl.[6] A61K *9/68*

U.S. Cl. 424—440 5 Claims

1. A process for preparing microencapsulated non-steroidal, anti-inflammatory, water-insoluble NSAID drug material which comprises:

(a) preparing an aqueous dispersion of said NSAID material having a particle size distribution ranging from about 25 to about 500 microns within an aqueous solution of cellulose acetate phthalate at a pH of about 6 or higher and containing from about 2 weight percent to about 8 weight percent of cellulose acetate phthalate;

(b) heating with agitation the aqueous dispersion of said NSAID material in the aqueous solution of cellulose acetate phthalate to a temperature sufficient to dissolve gelatin;

(c) adding an aqueous solution of gelatin to the heated dispersion of said NSAID material in the aqueous solution of cellulose acetate phthalate;

(d) gradually adding with continued agitation a solution containing an inorganic salt of the Hofmeister (lyotropic) series, to form both cellulose acetate phthalate and gelatin in liquid phase separate from the equilibrium liquid;

(e) slowly lowering the temperature of the dispersion to about 30° C. then dropping the temperature rapidly to about 15° C.;

(f) gradually adding a solution of glutaraldehyde to the cooled dispersion and after about 60 minutes;

(g) slowly adjusting the pH of the resulting solution to a pH of about 4 or lower while rendering said cellulose acetate phthalate polymer and the gelatin insoluble by slow addition of a dilute acid material and recovering the individual microcapsules thus formed.

5,814,333

FEED ADDITIVE FOR SOWS

Norimasa Onishi, Kawasaki; Yasuhiko Toride, Tokyo; Akinori Uehara, Kawasaki, and Ei-ichi Kokue, Kokubunji, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 745,190, Nov. 7, 1996, Pat. No. 5,728,398, which is a continuation of Ser. No. 317,360, Oct. 4, 1994, abandoned. This application Jul. 23, 1997, Ser. No. 899,338

Claims priority, application Japan, Oct. 5, 1993, 5-249405

Int. Cl.[6] A23K *1/165;* A61F *13/00;* A61K *1/17*

U.S. Cl. 424—442 4 Claims

1. A feed additive for sows comprising a reduced form of folic acid selected from the group consisting of 5,6,7,8-tetrahydrofolyl-poly-gamma-glutamate, 5-formyl-H_4 -folyl-poly-gamma-glutamate, 5,10-methylene-H_4-folyl-poly-gamma-glutamate, 5-methyl-H_4 -folyl-poly-gamma-glutamate, 5-methenyl-H_4-folyl-poly-gamma-glutamate, 10-formyl-H_4 -folyl-poly-gamma-glutamate, and 5-formimino-H_4-folyl-poly-gamma-glutamate.

5,814,334

Patent Not Issued For This Number

5,814,335

SPHINGOSOMES FOR ENHANCED DRUG DELIVERY

Murray S. Webb, Vancouver; Marcel B. Bally, Bowen Island; Lawrence D. Mayer, N. Vancouver; James J. Miller, Vancouver, and Paul G. Tardi, Richmond, all of Canada, assignors to Inex Pharmaceuticals Corporation, Canada

Continuation of Ser. No. 572,255, Dec. 14, 1995, Pat. No. 5,741,516, which is a continuation-in-part of Ser. No. 481,120, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 263,603, Jun. 20, 1994, Pat. No. 5,543,152. This application Sep. 17, 1997, Ser. No. 932,375

Int. Cl.[6] A61K *9/127;31/44*

U.S. Cl. 424—450 12 Claims

1. A liposome for delivery of an alkaloid therapeutic compound, produced by the process of:

forming a liposome from a mixture which comprises sphingomyelin and cholesterol, in a first buffered aqueous solution having an acidic pH greater than pH 2; and

suspending the liposome in a second buffered solution having a pH which is greater than that of the first buffered aqueous solution, whereby a transmembrane pH gradient is formed which facilitates the transfer of the therapeutic compound to the liposome.

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5,814,336

PHARMACEUTICAL DOSAGE FORM FOR COLONIC DELIVERY

Gary Robert Kelm, Cincinnati, and Gary Lee Manring, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 442,921, May 17, 1995, Pat. No. 5,686,106. This application Sep. 24, 1996, Ser. No. 719,108
Int. Cl.[6] A61K *9/32;9/36;9/52*
U.S. Cl. 424—463 8 Claims

1. A pharmaceutical composition in a unit dosage form for peroral administration in a human or lower animal, having a gastrointestinal tract comprising a small intestine and a colon with a lumen therethrough having an inlet to the colon from the small intestine, comprising:

a. a safe and effective amount of a therapeutically active agent incorporated into or coated on the surface of a dosage form selected from the group consisting of a spherical substrate, an elliptical substrate, a starch or gelatin hard capsule, or a compressed tablet, with a maximum diameter of about 3 mm to about 10 mm; and

b. a single enteric polymer coating which begins to dissolve in an aqueous media at a pH between 5 to 6.3 and compatible mixtures thereof, having a coating thickness of at least about 250 μm, and which provides that the therapeutically active agent is released at a point near the inlet to, or within the colon;

wherein the dosage form has a smooth surface free from edges or sharp curves; the elliptical substrate and the hard capsule have a ratio of the long to short diameters of no greater than about 1.5.

5,814,337

PHARMACEUTICAL FORMULATION

David Roy Merrifield; Paul Laurence Carter, both of Worthing, and David George Doughty, Epsom, all of England, assignors to Beecham Group plc, United Kingdom

Continuation of Ser. No. 934,757, Oct. 7, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,313
Int. Cl.[6] A61K *9/46*
U.S. Cl. 421—466 5 Claims

1. A pharmaceutical formulation having a composition within ±10% consisting of:

Ingredient		% w/w.
Amoxycillin trihydrate	as free acid	22.5
Potassium bicarbonate		21.04
Sodium glycine carbonate		46.7
Citric acid		6.01
Aspartame		1.13
Sodium saccharin		0.30
Lemon juice flavour		1.65
Cinnamon flavour		0.64.

2. A pharmaceutical formulation having a composition within ±10% consisting of

Ingredients	% w/w
Amoxycillin Trihydrate equivalent to Amoxycillin free acid	19.06
Potassium Clavulanate equivalent to Clavulanic acid	2.72
Potassium bicarbonate	20.26
Citric acid (anhydrous)	5.88
Aspartame	0.87
Sodium saccharin	0.23
Lemon dry flavour	1.59
Cinnamon flavour	0.61
Sodium glycine carbonate	48.77..

3. A pharmaceutical formulation having a composition within ±10% consisting of:

Ingredients		% w/w
Amoxycillin trihydrate	as free acid	25.0
Potassium clavulanate	as free acid	2.08
Sodium glycine carbonate		41.39
Potassium bicarbonate		20.86
Citric acid anhydrous		5.33
Aspartame		1.25
Sodium saccharin		0.33
Golden syrup flavour		1.25
Banana flavour		2.5.

4. A pharmaceutical formulation being a tablet formulation having a composition within ±10% consisting of:

Ingredients		% w/w
Amoxycillin trihydrate	as free acid	10.43
Potassium clavulanate	as free acid	2.61
Sodium glycine carbonate		52.00
Citric acid anhydrous		16.69
Sodium benzoate		5.58
Aspartame		3.13
Golden syrup flavour		3.13
Banana flavour		6.26.

5. A pharmaceutical formulation being a tablet formulation having a composition within ±10% consisting of:

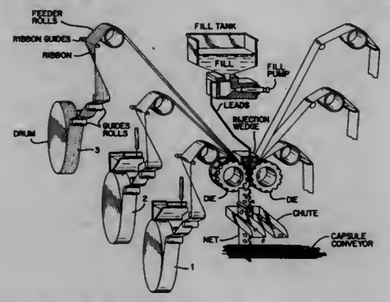
Ingredients		% w/w
Amoxycillin trihydrate	as free acid	18.89
Sodium glycine carbonate		61.39
Citric acid anhydrous		14.17
Aspartame		1.83
Lemon juice flavour		2.69
Cinnamon flavour		1.03.

5,814,338

DRUG DELIVERY SYSTEM

Paolo Alberto Veronesi, Milan, Italy, assignor to Therapicon S.R.L., Milan, Italy

PCT No. PCT/EP95/02488, § 371 Date Jan. 9, 1997, § 102(e) Date Jan. 9, 1997, PCT Pub. No. WO96/01612, PCT Pub. Date Jan. 25, 1996
PCT Filed Jun. 24, 1995, Ser. No. 765,952
Claims priority, application United Kingdom, Jul. 11, 1994, 9413951
Int. Cl.[6] A61K *9/48*
U.S. Cl. 424—472 48 Claims



1. A unit dosage drug delivery system which comprises:

a) a multiple layer capsule housing, comprising at least two coupled layers, sheaths or films from different materials, the first outer layer or sheath with hydrophilic character and the inner sheaths or films with hydrophobic character; and

b) a capsule filling, embodying one or more active drug substances, with conventional or extended drug release properties, with a remarkable hydrophobic character.

5,814,339

FILM COATED TABLET OF PARACETAMOL AND DOMPERIDONE

Gordon Prudhoe, Newcastle-Upon-Tyne, England, assignor to Janssen Pharmaceutica, N.V., Beerse, Belgium

PCT No. PCT/EP95/00719, § 371 Date Jun. 4, 1996, § 102(e) Date Jun. 4, 1996, PCT Pub. No. WO95/22974, PCT Pub. Date Aug. 31, 1995
PCT Filed Feb. 27, 1995, Ser. No. 652,514
Claims priority, application European Pat. Off., Feb. 28, 1994, 94200498
Int. Cl.[6] A61K *9/32;9/36*
U.S. Cl. 424—480 11 Claims

1. A tablet comprising

(a) a core comprising paracetamol and domperidone as the active ingredients and a pharmaceutically acceptable carrier, and

(b) a film coat; wherein the amount of pharmaceutically acceptable carrier is below 20% (w/w) of the total tablet weight.

5,814,340

CONTROLLED RELEASE SYSTEMS AND LOW DOSE ANDROGENS

Fernand Labrie, and Martin Lepage, both of Quebec, Canada, assignors to Endorecherche Inc., Quebec, Canada

Division of Ser. No. 398,096, Mar. 3, 1995, which is a division of Ser. No. 900,817, Jun. 24, 1992, Pat. No. 5,434,146, which is a continuation-in-part of Ser. No. 724,532, Jun. 28, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 484,742
Int. Cl.[6] A61K *31/56;31/58*
U.S. Cl. 424—489 22 Claims

1. A method of removing residual organic solvent from within sustained release particles having an average size between 5 μm and 40 μm, said particles comprising an active compound dispersed within a sustained-release binder, said method comprising the step of:

subjecting said particles to a strong vacuum wherein pressure is less than 1.0 torr and temperature is between 7° and 20° C. less than the glass transition temperature of said particles for a time period sufficient to reduce residual organic solvent within said particles to a concentration of less than 0.1% (by weight, relative to total weight of said particles).

5,814,341

COSMETIC COMPOSITIONS

Peter Fankhauser, Ettingen, Switzerland, and Thomas Maier, Schliengen, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

PCT No. PCT/EP95/00408, § 371 Date Aug. 12, 1996, § 102(e) Date Aug. 12, 1996, PCT Pub. No. WO95/22310, PCT Pub. Date Aug. 24, 1995
PCT Filed Feb. 6, 1995, Ser. No. 693,061
Claims priority, application United Kingdom, Feb. 18, 1994, 94031531
Int. Cl.[6] A61K *9/16*
U.S. Cl. 424—493 23 Claims

1. A cosmetic composition comprising:

A) a cosmetically acceptable carrier; and

B) 0.05 to 3.0% by weight, based on the weight of the total composition, of a β-1,3-glucan having a mean molecular weight of 2×10^6 to 10×10^6.

5,814,342

PROLONGED RELEASE MICROCAPSULES

Hiroaki Okada, Suita; Yayoi Inoue, Kyoto, and Yasuaki Ogawa, Otokuni-gun, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 458,679, Jun. 2, 1995, Pat. No. 5,643,607, which is a division of Ser. No. 188,918, Jan. 31, 1994, Pat. No. 5,480,656, which is a continuation of Ser. No. 649,727, Feb. 1, 1991, abandoned. This application Feb. 26, 1997, Ser. No. 806,954
Claims priority, application Japan, Feb. 13, 1990, 2-33133
Int. Cl.[6] A61K *9/52;9/62*
U.S. Cl. 424—493 17 Claims

1. A microcapsule exhibiting zero order release of luteinizing hormone-releasing hormone (LH-RH) analog for a period of at least two months upon administration, which is produced by preparing a water-in-oil emulsion comprising an inner aqueous phase free from a drug retaining substance containing 35 to 60% (W/W) of the LH-RH analog, and an oil phase containing a homopolymer of lactic acid or a copolymer of lactic acid and glycolic acid with a ratio of lactic acid/glycolic acid of 100/0 to 90/10, the homo-or copolymer having a weight-average molecular weight of 13,800 to 19,000 and a dispersion degree (ratio of weight-average molecular weight to number average molecular weight) of 1.5 to 2.5, as the material for forming an outer wall of the microcapsule; and then subjecting said water-in-oil emulsion to microencapsulation.

5,814,343

COSMETIC COMPOSITION

Malcolm N Jones, Cheshire; Michael Kaszuba, Merseyside, and Ian G Lyle, Deeside, all of United Kingdom, assignors to Unilever Patent Holding B.V., Vlaardingen, Netherlands

Division of Ser. No. 46,856, Apr. 15, 1993, Pat. No. 5,510,120. This application Feb. 21, 1996, Ser. No. 604,647
Claims priority, application United Kingdom, Apr. 15, 1992, 9208339
Int. Cl.[6] A61K *7/48;7/06;9/50;9/127*
U.S. Cl. 424—499 11 Claims

1. A cosmetic composition for topical application to skin and/or hair comprising: particles which include a cosmetically effective benefit agent, said particles having means to bind to an organic surface at a target location accessible on application of the composition to the skin and/or hair; and, optionally, a cosmetically acceptable vehicle, said means to bind comprising at least one antibody or antibody fragment carried by the particles at their surfaces, wherein said antibody or antibody fragment binds to a target site on the skin and/or hair.

5,814,344

METHOD FOR DELIVERING BIOACTIVE AGENTS INTO AND THROUGH THE MUCOSALLY ASSOCIATED LYMPHOID TISSUES AND CONTROLLING THEIR RELEASE

Thomas R. Tice; Richard M. Gilley; John H. Eldridge, and Jay K. Staas, all of Birmingham, Ala., assignors to Southern Research Institute, and The UAB Research Foundation, both of Birmingham, Ala.

Continuation of Ser. No. 116,484, Sep. 7, 1993, which is a continuation of Ser. No. 629,138, Dec. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 325,193, Mar. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 169,973, Mar. 18, 1988, Pat. No. 5,075,109, which is a continuation-in-part of Ser. No. 923,159, Oct. 24, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 469,218
Int. Cl.[6] A61K *9/52;39/085;39/12;39/39*
U.S. Cl. 424—501 16 Claims

1. A method of delivering a bioactive agent to an animal to initiate an immune response, comprising parenterally administering an immunogenically effective amount of microcapsules to said animal, wherein said microcapsules comprise said bioactive agent

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encapsulated in a biocompatible excipient and wherein said microcapsules are of a size of between approximately 1 micrometer and approximately 10 micrometers.

5,814,345

IMMUNE SUPPRESSIVE PRODUCT

Lee R. Beck, Lebanon, and Ralph J. Stolle, Oregonia, both of Ohio, assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Division of Ser. No. 815,630, Dec. 30, 1991, which is a continuation-in-part of Ser. No. 431,639, Nov. 6, 1989, Pat. No. 5,130,128, and Ser. No. 177,223, Apr. 4, 1988, Pat. No. 4,956,349, said Ser. No. 431,639 is a continuation-in-part of Ser. No. 161,039, Feb. 26, 1988, Pat. No. 4,879,110, said Ser. No. 161,039 and Ser. No. 177,223, each is a continuation-in-part of Ser. No. 1,848, Jan. 9, 1987, Pat. No. 4,897,265, which is a division of Ser. No. 546,162, Oct. 27, 1983, Pat. No. 4,636,384, which is a continuation-in-part of Ser. No. 384,625, Jun. 3, 1982, abandoned. This application Jun. 21, 1995, Ser. No. 460,277

Int. Cl.[6] A61K *35/20*

U.S. Cl. 424—535 **1 Claim**

1. An oral vaccine, wherein said vaccine comprises a composition wherein said composition comprises a non-antibody fraction of milk and wherein said non-antibody fraction of milk ameliorates, in a subject with an allergy to an allergen, the symptoms of said allergy of said subject to said allergen when said fraction is ingested by said subject and wherein said fraction is produced by the process comprising:

(a) administering said allergen to a milk-producing animal;

(b) collecting the milk from said animal of part (a);

(c) filtering the milk of part (b) through a filter which excludes molecules of greater than 100,000 daltons; and

(d) collecting the effluent from the filtration of part (c) wherein said effluent contains said fraction.

5,814,346

COMPOUND FOR TREATING ANIMAL EXCREMENT

Bruno Gamberini, Via Pier de Crescenzi, Italy, assignor to Progetto Emme S.r.l., Bologna, Italy

Filed Jun. 6, 1996, Ser. No. 659,432

Claims priority, application Italy, Jun. 9, 1995, BO95A0293

Int. Cl.[6] A01N *59/02;59/06;* **A61L** *11/00;2/16*

U.S. Cl. 424—665 **4 Claims**

1. An antiseptic powder for hardening, deodorizing, and disinfecting animal excrement comprising in admixture, an effective amount of:

a) infusorial earth;

b) calcium hypochlorite;

c) flowers of sulphur; and

d) a member selected from the group consisting of lime CaO, soda lime CaO+NaOH, hydrated lime $Ca(OH)_2$ and mixtures thereof.

5,814,347

THERAPEUTIC COMPOSITIONS CONTAINING A LITHIUM COMPOUND AND SILICA

James Derek Birchall, Mouldsworth, United Kingdom, assignor to Keele University, Staffordshire, United Kingdom

PCT No. PCT/GB94/00484, § 371 Date Nov. 6, 1995, § 102(e) Date Nov. 6, 1995, PCT Pub. No. WO94/20119, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 11, 1994, Ser. No. 522,265

Claims priority, application United Kingdom, Mar. 12, 1993, 9305040; Nov. 26, 1993, 9324360

Int. Cl.[6] A61K *33/14*

U.S. Cl. 424—677 **16 Claims**

1. A therapeutic composition for the treatment of virus-induced cutaneous infections, the composition comprising a lithium salt for blocking viral DNA replication and finely divided silica or a finely divided silicate which absorbs exudated fluid from vesicles.

5,814,348

QUICK DIE CHANGE DEVICE USED IN FOAMING OF INSULATION FOR REFRIGERATOR CABINETS

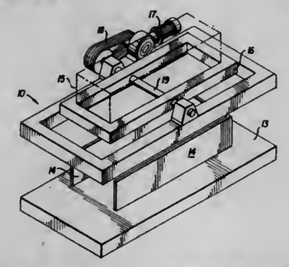
Bruno Moretti, Via F. lli Bronzetti, 4, I 27029 Vigevano, Italy

Continuation of Ser. No. 443,022, May 17, 1995, abandoned. This application May 9, 1997, Ser. No. 853,952

Claims priority, application Italy, Jun. 9, 1994, PV940003 U

Int. Cl.[6] B29C *33/30;44/58*

U.S. Cl. 425—4 R **10 Claims**



1. A quick die change device for use in the foaming of insulation for refrigerator cabinets comprising a bottom die adjustable in height, an upper die plate and a means to mechanically swivel said upper die plate, said upper die plate bearing a fixed number of differently contoured dies for obtaining insulation dimension changes as the dimensions of the refrigerator cabinet change, and being suitable for working together with said bottom die, said differently contoured dies being placed in such a way as to work together with said bottom die by swivelling of said upper die plate along a minor axis.

5,814,349

APPARATUS FOR THE CONTINUOUS PRODUCTION OF A SPUN-BOND WEB

Hans Georg Geus, Niederkassel-Rheidt; Detlef Frey, Niederkassel, and Sebastian Sommer, Troisdorf, all of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Germany

Filed May 15, 1997, Ser. No. 857,008

Claims priority, application Germany, May 21, 1996, 196 20 379.1

Int. Cl.[6] B29C *55/000*

U.S. Cl. 425—66 **10 Claims**

1. An apparatus for the continuous production of a spun-bond web of thermoplastic aerodynamically stretched filaments, comprising:

a spinneret producing a curtain of thermoplastic strands;

cooling means below said spinneret and including a process-air blower and means for blowing process air onto said curtain of strands for cooling same to form thermoplastic filaments;

a stretching system receiving said thermoplastic filaments and including at least one vertical drawing channel and traversed downwardly by said thermoplastic filaments and in which said thermoplastic filaments are aerodynamically entrained by the process air for aerodynamic stretching of said thermoplastic filaments;

a web-depositing system below said channel and including a downwardly diverging diffuser having, at a lower end, a mouth at which a web of interentangled thermoplastic aerodynamically stretched filaments is deposited, process air from said channel passing into said diffuser;

a continuously circulating sieve belt having a web-receiving stretch moving in a direction of advance below said mouth for collecting the interentangled thermoplastic aerodynamically stretched filaments and forming a web therefrom and displacing said web in said direction away from said mouth;

means forming an air inlet gap between a lower end of said channel and an upper end of said diffuser communicating with the atmosphere and admitting ambient air into said upper end of said diffuser, a path of said curtain from said spinneret to said web being closed from the ambient atmosphere except for said means forming said air inlet gap and said process air blower;

a first pressing roller pair upstream of said diffuser in said direction and engaging said belt;

a second pressing roller pair downstream of said diffuser in said direction and engaging said belt and said web;

means forming a suction shaft between said first and second roller pairs below said web-receiving stretch and provided with a suction blower for drawing air downwardly in said diffuser and drawing said thermoplastic aerodynamically stretched filaments against said belt; and

means for functionally separating said stretching system from said web-depositing system and including:

separate controls for said process-air blower and said suction blower for controlling same independently of one another,

dimensioning of said channel so that at said gap said channel forms an air lock shaft aerodynamically decoupling said stretching system from said web-depositing system, and

means at said gap for controlling a gap width thereof whereby for operational flexibility, a suction power of said suction blower and said gap width are varied in accordance with product-dependent conditions, a static pressure of air sucked through the diffuser above said belt stretch differs only slightly from ambient pressure, and ambient air entering the diffuser through said gap and mixing with air in the diffuser avoids a skein-forming deceleration.

5,814,350

HOT-CUT PELLETIZER

Siegward Rockstedt, Haubstrasse 1, D-53426, Schalkenbach, Germany

PCT No. PCT/EP95/02042, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO95/33609, PCT Pub. Date Dec. 14, 1995

PCT Filed May 30, 1995, Ser. No. 750,353

Claims priority, application Germany, Jun. 6, 1994, 44 19 786.1

Int. Cl.[6] B29B *9/06*

U.S. Cl. 425—67 **5 Claims**

1. A hot-cut pelletizer for thermoplastics comprising a housing (31) having a wall defining an interior space (12) which is supplied with a polymer melt and channels (11) which pass radially through the housing wall (3) and form openings in the housing wall to convey the polymer melt out of the housing, cutters (5) which rotate in a substantially water-free space and slide over the openings (14) of the channels (11) along a cutting face (8) running around the housing wall (3) to cut the polymer melt into pellets and radially fling the pellets from the cutting face, and a ring of stationary cooling water nozzles (18) surrounding the housing wall to direct cooling water jets (19) onto the cutters (5) in the manner of a jacket over the cutting face (8) at such a small radial distance from the cutting face that the polymer melt is thereby cooled directly after leaving the cutting face (8) and at the same time the cutters (5) are cooled up to the cutting edges by the cooling water.

5,814,351

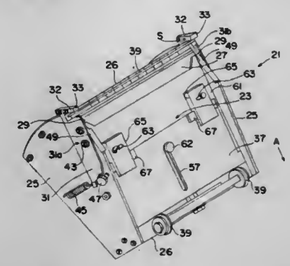
OUTSIDE CORNER MASTIC APPLICATOR

Morris F. Mower, Riverton, Utah, assignor to Axia Incorporated, Oak Brook, Ill.

Continuation-in-part of Ser. No. 389,142, Feb. 15, 1995, Pat. No. 5,670,182. This application Sep. 23, 1996, Ser. No. 710,686

Int. Cl.[6] B05B *11/02*

U.S. Cl. 425—87 **21 Claims**



1. An applicator for applying drywall mastic to either flat drywall joints or outside corner drywall joints, said applicator comprising:

a mastic housing having at least an applicator surface and a pair of side surfaces, said applicator surface having an aperture for mastic to move from an interior of said housing to a drywall with said applicator surface smoothing said mastic as it so moves,

a corner guide plate pivotally mounted on each of said side surfaces, to move between deployed and retracted positions, a projection on each of said guide plates for extending beyond said applicator surface when said guide plate is deployed in order to track an outside edge of a drywall corner joint and for not extending beyond said applicator surface when said guide plate is in said retracted position in order to move over a flat surface of a drywall joint,

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said projection and a side of said aperture being aligned so that said mastic is deployed to the corner edge against which said projection tracks,

resilient means for applying a bias strong enough to normally urge said guide plate to a deployed position beyond said applicator surface, said bias being weak enough to enable said guide plate to move to a retracted position responsive to using said applicator against a flat surface, whereby said guide plate normally pivots to extend said projection so that it can ride against an outside edge of a drywall corner joint or pivots to remove said projection under conventional working pressure against a flat drywall.

5,814,352

DEVICE FOR EXTRUDING AUTOMOTIVE WEATHER STRIP

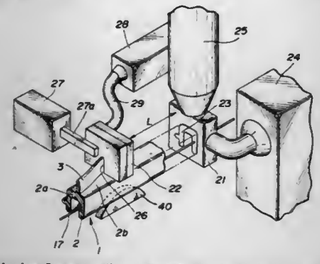
Hiroyoshi Imura, and Sumito Ichinobe, both of Chiba, Japan, assignors to Kinugawa Rubber Ind. Co., Ltd., Chiba, Japan

Filed Apr. 22, 1997, Ser. No. 844,759

Claims priority, application Japan, Apr. 30, 1996, 8-108996

Int. Cl.[6] B29C *47/06*

U.S. Cl. 425—112 **9 Claims**



1. A device for extruding a weather strip including an elongate major portion and an elongate lip portion which is integrally formed on said major portion, said device comprising:

a material extruder which feeds a first material for the major portion;

an additional material extruder which feeds a second material for the lip portion;

a fixed shaping die formed with a main extruding opening from which the first material from said material extruder is extruded for formation of said major portion; and

a movable shaping die formed with an auxiliary extruding opening from which the second material from said additional material extruder is extruded for formation of said lip portion, said movable shaping die being movable relative to said fixed shaping die,

wherein said movable shaping die is located in front of said fixed shaping die and spaced from the same by a given distance.

5,814,353

PLASTIC INJECTION MOLDING ELECTROHYDRAULIC MACHINE HYBRID DRIVE WITH JOINT FREQUENCY CONVERTER

Gunther Nagel, Steinheim, Germany, assignor to Voith Turbo GmbH & Co. KG, Heidenheim, Germany

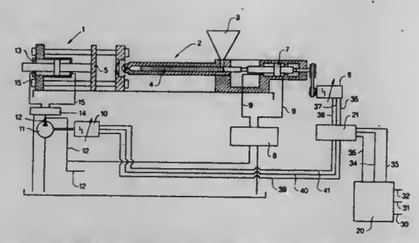
Filed Oct. 30, 1996, Ser. No. 739,176

Claims priority, application Germany, Nov. 2, 1995, 195 40 695.8

Int. Cl.[6] B29C *45/77*

U.S. Cl. 425—149 **21 Claims**

1. An electrohydraulic hybrid drive for a plastic injection molding machine having a plasticating section and a tooling section, said drive comprising:



a hydraulic actuator operatively connected to one of the plasticating section and the tooling section;

a feed system which supplies hydraulic fluid for actuation of said hydraulic actuator;

a first electric motor operatively connected to said feed system;

a further actuator operatively connected to the other of the plasticating section and the tooling section:

an extruder screw comprising a portion of the plasticating section;

a second electric motor operatively connected to said extruder screw;

a frequency converter electrically circuited to said first and second electrical motors whereby said frequency converter may actuate said first and second electrical motors; and

a switching device electrically circuited to said frequency converter and to at least one of said first electrical motor and said second electrical motor.

5,814,354

CENTERING EQUIPMENT FOR USE IN A BLOW MOLDING MACHINE

Mikio Uchiyama, and Tatsuo Suzuki, both of Tokyo, Japan, assignors to Tahara Machinery Limited, Tokyo, Japan

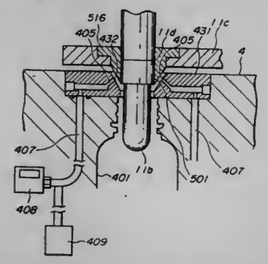
Division of Ser. No. 819,373, Mar. 17, 1997, which is a division of Ser. No. 274,014, Jul. 12, 1994, Pat. No. 5,656,214.

This application Nov. 3, 1997, Ser. No. 963,190

Claims priority, application Japan, Jul. 21, 1993, 5-179543; Aug. 31, 1993, 5-215546; Mar. 30, 1994, 6-60657

Int. Cl.[6] B29C *33/30;49/06;49/42*

U.S. Cl. 425—150 **1 Claim**



1. An automatic centering equipment for use in a blow molding machine, comprising:

a mold having an upper portion formed with a plurality of openings which are opposite to each other in the diametrical direction;

a source of a fluid;

passage means for providing said fluid to said plurality of openings of said upper portion of said mold;

a sensor arranged in said passage means, said sensor serving to sense predetermined variables of said fluid provided from said plurality of openings;

a blow pin having a centering member, said centering member facing said upper portion of said mold with a predetermined distance when said blow pin is inserted into said mold;

a control unit connected to said sensor, said control unit serving to compare said predetermined variables with each other to obtain differences between every opposite two of said plurality of openings; and

an actuator connected to said control unit, said actuator serving to moving said blow pin so that said differences are null.

5,814,355

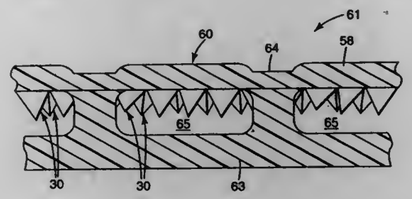
MOLD FOR PRODUCING GLITTERING CUBE-CORNER RETROREFLECTIVE SHEETING

Jeanine M. Shusta, Mahtomedi; Paul E. Marecki, May Township; Matthew R. Atkinson, Cottage Grove; Cheryl M. Frey, White Bear Lake; Olester Benson, Jr., Woodbury, and Harlan L. Krinke, Marine on the St. Croix, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1996, Ser. No. 640,383

Int. Cl.[6] B29D *11/00*

U.S. Cl. 425—373 **32 Claims**



1. A mold that comprises:

an array of cube-corner elements that are arranged in the array such that a retroreflective cube-corner sheeting that is formed thereon is capable of glittering when light is incident thereon, wherein the array of cube-corner elements includes generally intersecting grooves, wherein at least one groove has faces of adjacent cube-corner elements arranged such that a dihedral angle α located between the adjacent faces varies along the at least one groove.

5,814,356

MANUFACTURING METAL MOLD FOR ASSEMBLING A RESIN MOLDED ASSEMBLY

Hikaru Ito; Shinsuke Tsutsui; Yasunori Wada; Osamu Taniuchi, and Seiichi Kurosawa, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 7, 1996, Ser. No. 613,391

Claims priority, application Japan, Mar. 10, 1995, 7-079618; Mar. 10, 1995, 7-079619; Mar. 13, 1995, 7-081882; Mar. 13, 1995, 7-081883; Mar. 13, 1995, 7-081884; Mar. 13, 1995, 7-081885; Mar. 13, 1995, 7-081886; Mar. 13, 1995, 7-081887; Mar. 13, 1995, 7-081888; Mar. 13, 1995, 7-081889; Mar. 13, 1995, 7-081890; Mar. 13, 1995, 7-081891; Mar. 13, 1995, 7-081892; Mar. 13, 1995, 7-081893; Mar. 13, 1995, 7-081894; Mar. 13, 1995, 7-081895; Apr. 13, 1995, 7-113830; Apr. 13, 1995, 7-113832; Apr. 28, 1995, 7-128990; May 31, 1995, 7-158343; May 31, 1995, 7-158346; Jan. 11, 1996, 8-003028

Int. Cl.[6] B29C *45/33;45/40*

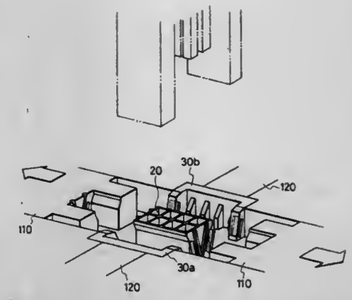
U.S. Cl. 425—556 **6 Claims**

1. A metal mold for molding a connector having a retainer, comprising:

a first mold;

a second mold opposed to said first mold, said second mold being movable in a first direction toward said first mold;

a pair of housing molds for forming a connector housing, said housing molds being slidable in a second direction perpendicular to said first direction; and



a pair of retainer molds for forming a retainer, said retainer molds being slidable in a third direction perpendicular to said first and second directions,

wherein said housing molds and said retainer molds are held on one of said first mold and said second mold,

said first mold, said second mold, said housing molds, and said retainer molds are closed to mold a connector housing and a retainer,

thereafter, said housing molds and the other of said first mold and said second mold are opened to form a space between said connector housing and said retainer, and

then, while the connector housing is held, said retainer molds are moved in the third direction to fit said retainer with said connector housing in a provisional lock state.

5,814,357

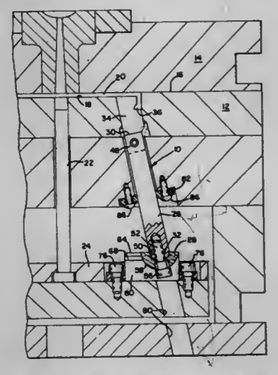
CORE LIFTER SYSTEM FOR USE IN A PLASTIC INJECTION MOLD

Borislav Boskovic, 2102 Bannockburn, Inverness, Ill. 60067

Filed Aug. 15, 1997, Ser. No. 912,083

Int. Cl.[6] B29C *45/44*

U.S. Cl. 425—556 **19 Claims**



1. A core lifter system for a plastic mold, comprising

a. a blade retainer having a blade-mounting end and an opposite coupling end,

b. a support for said blade retainer, said support having a socket shaped to engage said coupling end, said coupling end being shaped to conform to said socket,

c. means for permitting linear translation of said support on an ejector plate, and

d. means for immobily securing said blade retainer in said socket with said blade retainer fixed at a desired angle of inclination relative to said support.

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5,814,358

INJECTION MOLDING APPARATUS FOR PROCESSING THERMOPLASTIC MATERIALS

Stefan Bock, Bonn, Germany, assignor to Krupp Kautex Maschinenbau GmbH, Boon, Germany

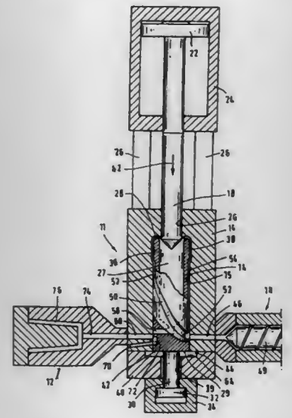
PCT No. PCT/DE96/00847, § 371 Date Dec. 23, 1996, § 102(e) Date Dec. 23, 1996, PCT Pub. No. WO96/35568, PCT Pub. Date Nov. 14, 1996

PCT Filed May 8, 1996, Ser. No. 765,564

Claims priority, application Germany, May 10, 1995, 195 17 009.1

Int. Cl.[6] B29C *45/78*

U.S. Cl. 425—557 **12 Claims**



1. An injection molding apparatus for processing thermoplastic materials comprising at least one plasticizer unit for filling at least one injection molding cylinder with an associated ejection piston for emptying said cylinder and at least one injection molding mold, wherein the injection molding cylinder has a sleeve which is arranged axially reciprocally in a housing between a position in which the communication with the injection molding mold is interrupted and a position in which the communication with the injection molding mold exists, wherein a passage is provided between the sleeve and the housing at least in the position in which the communication with the injection molding mold is interrupted and one end of the passage is in communication with an internal storage space defined by the sleeve and having an entry end, a feed conduit for the plastic material coming from at least one plasticizer unit, the feed conduit opening into a passage adjacent an outlet end of the internal storage space, an outlet conduit for the plastic material stored in the internal storage space extending from the outlet end of the storage space towards the injection molding mold at the outlet end, the sleeve being longitudinally displaceable so that in one end position of the sleeve the outlet conduit from the storage space is closed and a through-flow of plastic material is not possible and in a second end position of the sleeve the outlet conduit from the storage space is connected to the injection molding mold, the outside diameter of the ejection piston being slightly smaller than the inside diameter of the sleeve so that an annular gap exists between the two.

5,814,359

SALT SOLUTION FOR PRODUCING SOY SAUCE AND PROCESS FOR PRODUCING SOY SAUCE

Masami Oura, and Hironaga Hashiba, both of Noda, Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Oct. 15, 1996, Ser. No. 730,204

Claims priority, application Japan, Oct. 30, 1995, 7-281909

Int. Cl.[6] A23L *1/238*

U.S. Cl. 426—46 **1 Claim**

1. A process for preparing soy sauce comprising the steps of:

mixing a soy sauce koji and a salt solution to form a mixture (maromi), fermenting and aging the mixture,

compressing the aged mixture to obtain a crude soy sauce,

and heat-treating the crude soy sauce at a temperature of 90°–130° C. for 30 minutes to 5 seconds using a plate-type heat exchanger, wherein the salt solution is obtained by admixing and reacting sodium carbonate or potassium carbonate with a crude salt solution comprising dissolved sea salt or dissolved rock salt to precipitate calcium and/or magnesium hardness components contained in the crude salt solution in the form of calcium carbonate and/or magnesium carbonate, and separating and removing the carbonate sediments and neutralizing a supernatant liquid.

5,814,360

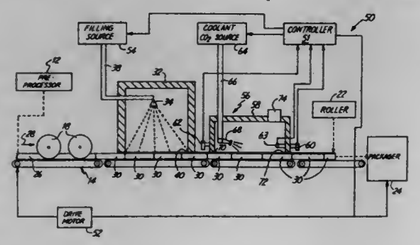
SYSTEM FOR PRODUCING A FILLED ROLLED DOUGH PRODUCT

Joseph C. McDilda, Brooklyn Park, and Kenneth Litke, Becker, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 448,888, May 24, 1995, abandoned. This application Jun. 21, 1996, Ser. No. 668,550

Int. Cl.[6] A21D *10/00*

U.S. Cl. 426—94 **12 Claims**



1. A method of processing a rolled dough product the method comprising:

moving a dough sheet along a dough travel path;

applying a filling to the dough sheet; and

exposing the filling on the dough sheet to a cooling source prior to the dough sheet being rolled so that the filling attains a viscosity in a desired range effective to obtain a desired tackiness so that the dough sheet containing the filling can be easily rolled to form the rolled dough product.

5,814,361

Patent Not Issued For This Number

5,814,362

METHOD AND APPARATUS FOR REFINING CHOCOLATE MASS

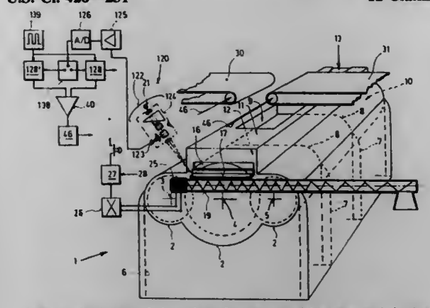
Kurt Müntener, Bad Salzuflen, Germany, assignor to Richard Frisse GmbH, Bad Salzuflen, Germany

Filed May 30, 1997, Ser. No. 866,897

Claims priority, application Germany, Jun. 11, 1996, 19623206.6

Int. Cl.[6] A23G *1/06;1/10*

U.S. Cl. 426—231 **12 Claims**



1. A method for refining chocolate mass within a trough including at least one compartment wherein the chocolate mass is treated and to which at least one additive is added after beginning such treatment, the method comprising

continuously feeding cocoa containing mass to a conching machine having an inlet, said at least one compartment and an outlet;

adding said at least one additive into said compartment to provide a chocolate composition of a desired proportion of said cocoa containing mass and said additive;

monitoring said proportion by means of at least one spectrometer after said step of adding, said spectrometer taking an optical signal from said mass and said at least one additive and providing an output signal representative for said proportion;

controlling the amount of said at least one additive during said adding step using said output signal.

5,814,363

PROCESS FOR PRODUCING A STERILE MILK PAP

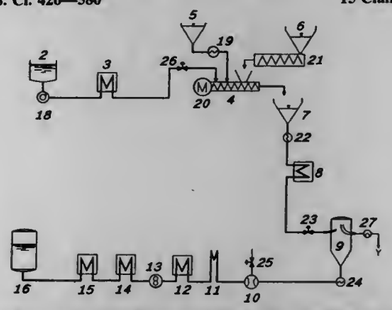
Holger Kuehner, Muehldorf am Inn, Germany, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 19, 1994, Ser. No. 358,353

Claims priority, application European Pat. Off., Jan. 8, 1994, 94100208

Int. Cl.[6] A23C *9/137;* **A23L** *1/10*

U.S. Cl. 426—580 **15 Claims**



1. A process for preparing a sterile milk pap comprising mixing heated milk with a cereal product to swell the cereal product during mixing to obtain a pap preparation mixture, heating the mixture so that vegetative microbes are destroyed to obtain a heat-treated mixture, degassing the heat-treated mixture to obtain a degassed mixture to avoid oxidation of the mixture, heating the degassed mixture under ultra-high-temperature conditions to sterilize the degassed mixture to obtain a sterilized, degassed mixture and then, cooling the sterilized degassed mixture.

5,814,364

Patent Not Issued For This Number

5,814,365

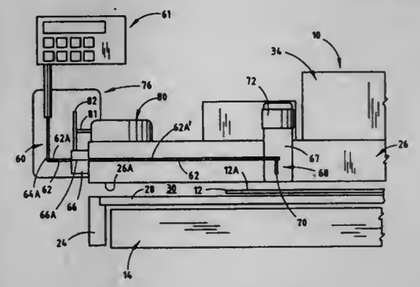
REACTOR AND METHOD OF PROCESSING A SEMICONDUCTOR SUBSTATE

Imad Mahawili, Grand Rapids, Mich., assignor to Micro C Technologies, Inc., Kentwood, Mich.

Filed Aug. 15, 1997, Ser. No. 911,638

Int. Cl.[6] C23C *16/00*

U.S. Cl. 427—10 **42 Claims**



1. A reactor for processing a substrate, said reactor comprising:

a housing defining a processing chamber;

a light source supported in said housing;

a heater positioned in said housing, said heater being adapted to heat the substrate;

at least one gas injector adapted to inject at least one gas into said processing chamber onto a discrete area of the substrate; and

a photon density sensor extending into said housing, said photon density sensor being adapted to measure the emissivity of the substrate and to move between a first position wherein said photon density sensor is directed to said light source and a second position wherein said photon density sensor is positioned for directing toward the substrate.

28. A method of processing a semiconductor substrate comprising the steps of:

providing a processing chamber;

supporting the substrate in the processing chamber;

directing light into the processing chamber toward the substrate;

providing a photon density sensor;

directing the photon density sensor to the light;

measuring the incident photon density from the light with the photon density sensor;

repositioning the photon density sensor to direct the photon density sensor to the substrate;

measuring the reflection of the light off the substrate;

comparing the measured incident photon density to the reflected light to calculate the substrate temperature;

heating the substrate; and

injecting at least one reactant gas into the chamber through at last one injector.

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5,814,366

METHOD OF MANUFACTURING MULTILAYERED CERAMIC SUBSTRATE

Junzo Fukuta; Koji Shibata; Nozomi Tanifuji, all of Nagoya; Masaya Hashimoto, Sakai; Yoshiaki Yamade, Nishinomiya, and Hidenori Kataura, Mine, all of Japan, assignors to Sumitomo Metal Electronics Devices Inc., Mine, and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

Filed Jul. 17, 1996, Ser. No. 682,410

Claims priority, application Japan, Jul. 17, 1995, 7-179958; May 13, 1996, 8-117296

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—96 **11 Claims**

1. A method of manufacturing a multilayered ceramic substrate with an integrally incorporated capacitor by co-firing the substrate and the capacitor at a substrate firing temperature ranging between 800° to 1,000° C., the method comprising the sequential steps of:

forming a substrate laminate having a capacitor interposed between green insulator layers each comprised of a ceramic insulator material, the capacitor comprising a green dielectric layer comprised of a ceramic dielectric material and electrode conductors sandwiching the dielectric layer;

laminating release green sheets unsintered at the substrate firing temperature ranging between 800° to 1,000° C. to both sides of the substrate laminate respectively;

firing the substrate laminate with the release green sheets at the substrate firing temperature ranging between 800° to 1,000° C. while applying thereto a pressure normal to an exposed surface of one of the release green sheets, the pressure ranging between 2 and 20 kgf/cm^2; and

removing the release green sheets from both sides of the fired assemblage, thereby fabricating the multilayered ceramic substrate with the integrally incorporated capacitor.

5,814,367

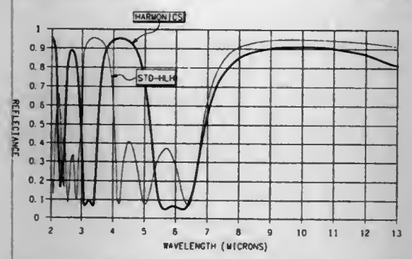
BROADBAND INFRARED AND SIGNATURE CONTROL MATERIALS AND METHODS OF PRODUCING THE SAME

Ronald N. Hubbard, Rancho Sante Fe; Tu Chau Luong, San Diego, both of Calif., and Bruce H. Schrier, Okinawa, Japan, assignors to General Atomics, San Diego, Calif.

Continuation-in-part of Ser. No. 106,488, Aug. 13, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 349,957

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—162 **25 Claims**



1. A method for producing a thin multilayer signature control element that is infrared reflective in the far infrared, that is comprised of alternating layers of materials of high refractive index and low refractive index, and that is capable of attaining a selected infrared reflectance performance with a minimal number of alternating layers, comprising the steps of

(a) providing as the material of low refractive index a material having a coefficient of extinction of about 10^{-3} or greater and a refractive index in the order of about 1.5 or less,

(b) providing said material of low refractive index in the form of a thin film that is of optical thickness but sufficiently thin that the film is substantially transmissive in the infrared spectrum,

(c) providing as the material of high refractive index a material having a refractive index that is about 2.0 or more greater than the refractive index of the material of low refractive index,

(d) depositing onto a substrate at respective optical thicknesses alternating layers of said material of high refractive index and said thin film of said material of low refractive index, and

(e) forming alternating layers of said materials into a multilayer film that is infrared reflective in the far infrared and that provides in as few as 3 to 7 layers an infrared reflectance performance comparable to that of conventional optical filters comprised of 15 to 30 layers of materials having a refractive index differential less than 2.0.

5,814,368

METHOD OF SPREADING PARTICLES AND SPREADING APPARATUS

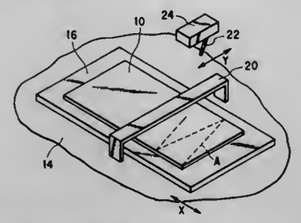
Yuka Yamada, Himeji, and Ikuo Hiruta, Hyogo-ken, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1997, Ser. No. 806,637

Claims priority, application Japan, Feb. 26, 1996, 8-038117

Int. Cl.[6] B05D *1/12;5/00*

U.S. Cl. 427—180 **8 Claims**



1. A method of spreading spacing particles on a surface of a substrate used to form a liquid crystal display panel, the method comprising the steps of:

relatively moving said substrate and a spreading nozzle adapted to spread said spacing particles on said substrate with respect to one another as said spreading nozzle spreads said spacing particles such that said spacing particles spread from said spreading nozzle form a predetermined trace on said surface of said substrate; and

discharging electric charge on said substrate while relatively moving said substrate and said spreading nozzle with respect to one another such that said spreading nozzle spreads said spacing particles on a discharged portion of said surface of said substrate.

5,814,369

SYSTEM AND METHOD FOR DEPOSITING MEDIA IN A PATTERN ON A MOVING SHEET USING A MEDIA RETAINING MEMBER

Mat Bockh, Gilford; Thomas J. Zickell, Stratham, both of N.H.; Charles Diman, Billerica, and Stephen Mahoney, Cambridge, both of Mass., assignors to Environmental Reprocessing, Inc., Brentwood, N.H.

Filed Dec. 14, 1995, Ser. No. 572,125

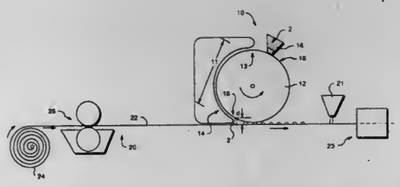
Int. Cl.[6] B05D *1/40*

U.S. Cl. 427—188 **24 Claims**

1. A method of depositing granular media in a pattern directly on a moving surface of a continuous web, said method comprising the steps of:

rotating a media applicator roll;

moving said continuous web on which said granular media is to be deposited at a linear velocity beneath said media applicator roll;



feeding said granular media to a media receiving region on said media applicator roll;

maintaining said granular media in contact with said media receiving region of said media applicator roll from a top region of said media applicator roll to a bottom region beneath said media applicator roll; and

releasing said granular media from said media receiving region of said media applicator roll at said bottom region directly onto said moving surface of said continuous web in said pattern, wherein said granular media is directly deposited on said moving surface at an acute angle with respect to said moving surface.

5,814,370

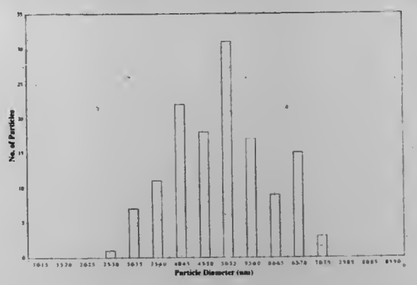
ENCAPSULATION OF NANOCLUSTERS IN DRIED GEL MATERIALS VIA AN INVERSE MICELLE/SOL GEL SYNTHESIS

Anthony Martino, Albuquerque, N. Mex.; Stacey A. Yamanaka, Dallas, Tex.; Jeffrey S. Kawola, Albuquerque, N. Mex.; Steven K. Showalter, Albuquerque, N. Mex., and Douglas A. Loy, Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Jun. 11, 1996, Ser. No. 664,210

Int. Cl.[6] B01J *13/02*

U.S. Cl. 427—213.35 **13 Claims**



1. A method to encapsulate a substance as a nanocluster having a size of from about 1–20 nm in a dried gel material comprising:

combining a surfactant with an apolar solvent to form an inverse micelle mixture;

adding a salt of the substance to the inverse micelle mixture and mixing to solubilize the salt in the mixture;

adding a gel precursor solution and a reducing agent to the mixture to form a colloidal suspension of the substance in the mixture;

adding a condensing agent to the mixture to form a gel; and

aging and drying the gel which contains nanoclusters of the substance to form the dried gel material.

5,814,371

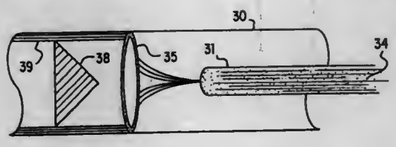
HOT MELT FLUIDIZED CLADDING OF INNERDUCT LINER WITH A LINER OF VARYING THICKNESS

Michael W. Ferralli, Fairview, Pa., assignor to Technology Licensing Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 546,018, Oct. 20, 1995, Pat. No. 5,658,613, which is a continuation-in-part of Ser. No. 379,880, Jan. 27, 1995, Pat. No. 5,505,992. This application Apr. 25, 1996, Ser. No. 638,014

Int. Cl.[6] B05D *7/22*

U.S. Cl. 427—236 **19 Claims**



1. A method of cladding the inner surface of an innerduct or conduit, said method comprising the steps of:

a. fluidizing a lubricous polymeric material to be deposited on said inner surface;

b. heating the conduit to a temperature less than the melting point of said polymeric material and innerduct or conduit;

c. depositing the fluidized material through a nozzle on said inner surface in a direction along the longitudinal axis of said conduit to provide a coating thereover.

5,814,372

PROCESS FOR FORMING POROUS COMPOSITE MEMBRANE

Wilson Moya, Derry, N.H., assignor to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 545,230, Oct. 19, 1995, Pat. No. 5,629,084. This application Sep. 26, 1996, Ser. No. 718,980

Int. Cl.[6] B32B *3/26;5/14*

U.S. Cl. 427—245 **29 Claims**

1. The process for forming a composite porous membrane formed from a porous membrane substrate having an average pore size of between about 0.01 and 10 microns formed of a first polymer, said substrate being directly coated over its entire surface with an uncrosslinked self-crosslinkable second polymer composition in a solvent and which is subsequently crosslinked and rendered insoluble in situ on said substrate which comprises:

a) impregnating said substrate with a solution of said self crosslinkable second polymer composition and a free radical polymerization initiator and in the absence of a crosslinking agent in said solvent,

b) exposing the impregnated substrate from step a) to an energy source selected from the group consisting of ultraviolet light, a mild heat source which effects a temperature of said solution between about 45° C. and 100° C. and exposure to ultraviolet light and said mild heat source for a period of time sufficient to effect crosslinking of said second polymer composition, and to render said crosslinked second polymer composition insoluble and

c) washing said impregnated substrate from step b) with a liquid to remove soluble polymer not rendered insoluble, excess polymerization initiator and reaction products of said polymerization initiator.

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5,814,373

HEAT-RESISTANT HYDROXY-FUNCTIONAL POLYETHERS AS THERMOPLASTIC BARRIER RESINS

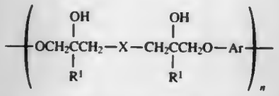
Jerry E. White; H. Craig Silvis; Stephen E. Bales; Michael N. Mang, and Muthiah N. Inbasekaran, all of Midland, Mich., assignors to Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 800,340, Nov. 26, 1991, abandoned. This application Oct. 1, 1993, Ser. No. 131,110

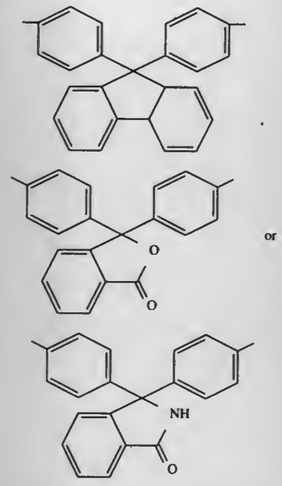
Int. Cl.[6] B65B *55/00*

U.S. Cl. 427—386 **3 Claims**

1. A method of packaging oxygen-sensitive materials which comprises placing the materials inside a barrier container or packaging film comprising a thermoplastic polymer having a glass transition temperature greater than 120° C., an oxygen transmission rate of less than 10.0 cm^3-mil/100 in^2-atm-day and repeating units represented by the formula:



wherein Ar is a "cardo" diphenylene group represented by one of the formulas:



X is an alkylimino, an arylimino, an alkylenediamino, an arylenediamino, an arylenedisulfonamido, an arylenedicarboxy moiety or an arylenedioxy moiety wherein the arylene portion of said moiety may or may not be a "cardo" diphenylene group; R^1 is independently hydrogen or a hydrocarbyl moiety and n is an integer from 10 to 10,000.

5,814,374

LOW VOC AQUEOUS COATING COMPOSITION

Asare Nkansah, Lansdale; Stewart Orlyn Williams, Hatfield, and Richard Foster Merritt, Fort Washington, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 19, 1996, Ser. No. 666,107

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—386 **7 Claims**

1. An aqueous, film-forming coating composition comprising at least one aqueous latex polymer binder covalently grafted with polyvinyl alcohol; said aqueous latex polymer binder having a glass transition temperature (Tg) in the range of from −35° C. to +30° C. and having a first reactable group selected from the group consisting of beta-ketoester, aldehyde, amine, anhydride, isocyanate, epoxy, and hydrazide; said polyvinyl alcohol having a second reactable group selected from the group consisting of beta-ketoester, aldehyde, amine, anhydride, isocyanate, epoxy, and hydrazide which is complementary to the first reactable group in the aqueous latex polymer binder; said coating composition having less than two percent volatile organic compounds based on the dry weight of the polymer binder.

5,814,375

PROCESS AND DEVICE FOR AUTOMATICALLY COATING OBJECTS WITH A SPRAYER

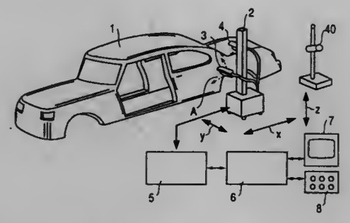
Hans Hissen, Darmstadt, Germany, assignor to Cegelec AEG Anlagen und Automatisierungstechnik GmbH, Frankfurt, Germany

Continuation of Ser. No. 302,920, Dec. 22, 1994, abandoned. This application Feb. 28, 1997, Ser. No. 808,157

Claims priority, application Germany, Mar. 21, 1992, 42 09 279.5

Int. Cl.[6] B05D *1/02;* **B05B** *3/00*

U.S. Cl. 427—421 **8 Claims**



1. A method of automatically coating objects having length, width and height dimensions, with a spraying control device, which spraying control device includes at least one spraying tool that is movable under program control by a processor on movement paths by a three- or four-axis device, while the objects are moving in one transport direction, comprising:

providing the processor with a movement program for the at least one spraying tool for objects which differ with respect to their dimensions;

modifying the movement program based on a length of each of the objects to provide a length-direction path for the at least one spraying tool with respect to the length of the respective objects, wherein the length direction is associated with one axis of a Cartesian coordinate system and extends in the transport direction;

storing data related to at least one outer contour of a surface of each of the objects extending in a direction perpendicular to the length direction and utilizing the data to provide contour-direction paths extending in at least one direction perpendicular to the length direction for the at least one spraying tool;

superposing the contour-direction paths of the at least one spraying tool to the length-direction path to adapt the length-direction path to the dimensions of the object in a direction perpendicular to the length direction, thereby generating a resulting path for the at least one spraying tool;

moving the at least one spraying tool along said resulting path; and

spraying the objects by the at least one spraying tool moving along said resulting path.

5,814,376

GRAVURE COATING SYSTEMS AND MAGNETIC PARTICLES IN ELECTROCHEMICAL SENSORS

Michael D. Cabelli, Wilmington, Del., assignor to Ohmicron Medical Diagnostics, Inc., Newton, Pa.

Continuation-in-part of Ser. No. 372,515, Jan. 13, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 488,133

Int. Cl.[6] B05D *1/28;3/02*

U.S. Cl. 427—428 **6 Claims**

1. A gravure coating process, said process comprising, in the following sequence, the steps of:

(1) creating a solution comprising an electroconductive polymer dissolved in an organic solvent,

(2) absorbing said solution onto a gravure surface of a cylinder,

(3) transferring said solution directly from the gravure surface of the cylinder to a substrate surface, said surface being downwardly disposed,

(4) evaporating the organic solvent from the solution transferred to the substrate surface so as to leave a film of the electroconductive polymer on the substrate surface wherein the substrate surface comprises a metallized pattern.

5,814,377

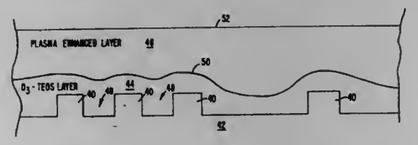
METHOD AND APPARATUS FOR CREATING STRONG INTERFACE BETWEEN IN-SITU SACVD AND PECVD SILICON OXIDE FILMS

Stuardo Robles, Sunnyvale; Visweswaren Sivaramakrishnan, Cupertino; Maria Galiano, San Jose, and Victoria Kithcart, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 568,241, Dec. 6, 1995, abandoned. This application Jul. 8, 1997, Ser. No. 889,703

Int. Cl.[6] H05H *14/00;* **H01L** *21/00;* **B05D** *3/00*

U.S. Cl. 427—579 **23 Claims**



23. A method for depositing a layer of silicon oxide on a substrate using a subatmospheric chemical vapor deposition (SACVD) process followed by a plasma-enhanced chemical vapor deposition (PECVD) process without an intermediary clean or etch process, said method comprising steps, in order, of:

(a) flowing a first silicon containing gas and ozone into a chamber at a pressure and a temperature sufficient to deposit a first portion of the layer of silicon oxide on the substrate;

(b) stopping the flow of the first silicon containing gas; and simultaneously

(c) diluting the flow of the ozone; to limit occurrences of reactions after step (b) and thereby avoid formation of interlayer surface defects on the first portion of the layer;

(d) controllably decreasing the pressure;

(e) flowing oxygen into the chamber;

(f) controllably increasing the pressure;

(g) flowing a second silicon containing gas into the chamber, wherein said second silicon containing gas is identical to, or different from, the first silicon containing gas of step (a);

(h) igniting a plasma; and

(i) depositing a second portion of the layer on the first portion of the layer of silicon oxide.

5,814,378

POLYMERIZABLE COMPOUND AND A LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME

Noriaki Onishi, Nara; Nobuaki Yamada, Higashiosaka; Kenji Suzuki, Soka; Hoyo Mizobe, Soka, and Masahiko Yoshida, Soka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

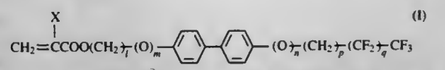
Filed Jul. 11, 1996, Ser. No. 678,294

Claims priority, application Japan, Jul. 11, 1995, 7-175264

Int. Cl.[6] G02F *1/1337*

U.S. Cl. 428—1 **9 Claims**

4. A liquid crystal display device including a pair of substrates, at least one of the substrates being transparent, and a liquid crystal layer having a liquid crystal region surrounded by a polymer region, the liquid crystal layer being interposed between the pair of substrates, wherein the polymer region is formed from a monomer at least comprising the polymerizable compound represented by formula (I):



(I)

where x represents a hydrogen atom or a methyl group; l represents an integer in the range of 0 to 14: m represents 0 or 1 n represents 0 or 1: p represents an integer in the range of 0 to 6; and q represents an integer in the range of 0 to 9,

wherein m is 0 under the condition l=0, and 1 under the condition l≠0.

5,814,379

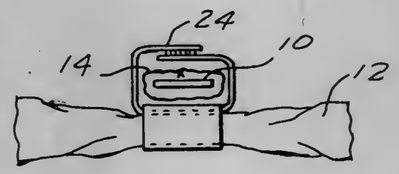
ORNAMENTAL BAND

Arlene Roccaforte, 8 Moraine Rd., Morris Plains, N.J. 07950

Filed Aug. 26, 1996, Ser. No. 701,997

Int. Cl.[6] D04D *7/10*

U.S. Cl. 428—5 **11 Claims**



1. An ornamental band for encircling an object comprising a strip of elastic material large enough to be stretched over and retained on the object, a tubular cover surrounding and enclosing said strip along substantially the entire length of said strip, said cover formed of substantially non-stretchable material bunched so as to have an effective length which is expandable as said strip is stretched and means for retaining an article on said band.

5,814,380

COLLAPSIBLE LAWN ORNAMENT AND METHOD

Gregory J. Tamborello, Tampa, Fla., and Robert D. Berkley, Haughton, La., assignors to Sport-Flex, Inc., Bossier City, La.

Filed Aug. 7, 1997, Ser. No. 908,329

Int. Cl.[6] A47G *35/00*

U.S. Cl. 428—9 **20 Claims**

1. A collapsible three-dimensional ornament, which ornament comprises:

a) an ornament, comprised of two sheets of closed-cell, flexible, thermoplastic, foam sheet material, heat sealed together at abutting edges of the sheet material and forming a three-dimensional ornament of selected design;

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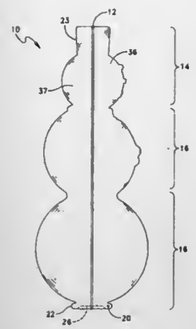


b) the ornament, comprised of a plurality of connected head, upper body, lower body and base sections, the head, upper body and lower body sections of progressively larger size;

c) an air vent in the ornament to permit the entry and exhaust of air from the interior of the ornament; and

d) the ornament, characterized and adapted to move between a use position and a reduced-height, collapsed position, by the application of hand pressure on the head section, to collapse the head and upper body into the lower body section, and to permit the use of hand pressure to assist the collapsed position of the ornament to resume the original use position.

5,814,381

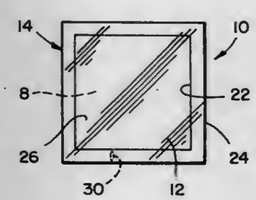
PELLICLE ASSEMBLY HAVING A VENTED FRAME

George Nein-Jai Kuo, Los Altos, Calif., assignor to Inko Industrial Corporation, Sunnyvale, Calif.

Filed Apr. 4, 1997, Ser. No. 835,106

Int. Cl.[6] B32B *3/02;3/30*

U.S. Cl. 428—14 **14 Claims**



1. A pellicle assembly comprising:

a peripheral frame having an inner surface defining an interior of said frame, an outer surface, and spaced first and second edges joining said inner and outer surfaces, one of said edges being mountable to an optical membrane and the other of said edges being mountable to said selected surface;

at least one vent for providing a passageway for a gaseous substance between said interior of said frame and the atmosphere outside of said frame, said vent including a recess formed in said first edge of said frame and at least two inlets opening into said recess, one of said inlets coupling said recess to said interior of said frame and the other of said inlets coupling said recess to the atmosphere outside of said frame, at least one of said inlets being located in said first edge of said frame.

5,814,382

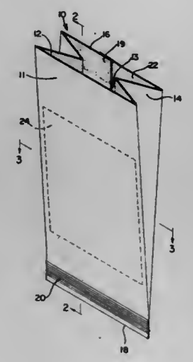
BAG AND METHOD OF MAKING THE SAME

Gilbert N. Yannuzzi, Jr., Ames, Iowa, assignor to American Packaging Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 278,919, Jul. 22, 1994. This application Sep. 7, 1994, Ser. No. 301,853

Int. Cl.[6] B65D *33/00;* **B65B** *9/00;* **B32B** *7/12*

U.S. Cl. 428—34.3 **10 Claims**



1. A roll comprising a continuous tubular web having a plurality of tube lengths which can be made into bags suitable for use in microwave cooking,

said tubular web comprising a flexible material, the flexible material including paper material,

said tubular web comprising a plurality of successive tube lengths connected serially in end-to-end relationship,

each tube length comprising a plurality of side panels and having an open end and a closed end,

a deposit of a cold seal adhesive across the inside of the closed end of each tube length for sealing the side panels together at the closed end of each tube length,

said cold seal adhesive being an adhesive which exhibits an affinity for itself whereby when two separate surfaces having said cold seal adhesive thereon are brought together under pressure they exhibit a strong tendency to stick to each other which provides a tearing or destruct bond on the flexible material without the aid of heat or dwell time, as is required in a typical heat seal, when brought together under pressure only,

said side panels of each tube length having pressure applied thereto at locations whereat said cold seal deposit is located to form a cold seal closure extending thereacross whereby each tube length is closed at one end by said cold seal closure,

said cold seal closure formed from the cold seal adhesive being such that at ambient temperatures said cold seal closure cannot be opened without tearing the flexible material of the web and such that at elevated temperatures produced in microwave cooking said cold seal closure forms a peelable closure that may be opened without tearing the flexible material of the web,

a deposit of heat seal adhesive at the open end of each tube length for use in closing this end of the tube length after it is filled with a product,

said heat seal adhesive deposit being in the form of a band extending around the inner surface of the side panels at the open end of each tube length, and

the deposit of heat seal adhesive being adapted to form a heat seal closure that forms a bond that is stronger than the bond formed by the cold seal adhesive at the elevated temperatures produced by microwave cooking operation.

5,814,383

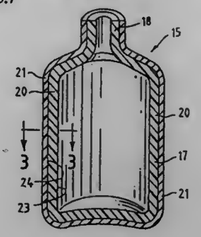
CONTAINERS WITH IMPROVED CREASE-CRACK RESISTANCE

Gregory M. Fehn, Barrington, Ill., assignor to Continental Plastic Containers, Inc., Norwalk, Conn.

Filed Jul. 23, 1996, Ser. No. 685,413

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—35.7 **162 Claims**



16

1. A substantially form retaining container for oil having a wall defining an interior and an exterior, at least a part of said wall comprising a plurality of layers including:

(A) a first relatively stiff layer in close proximity to said interior of said container and formed from a polymer; said polymer, when on the interior surface of said layer and in close proximity to said oil, absorbing said oil, and after absorbing said oil, displaying less stiffness than when out of close proximity to said oil, said first layer being sufficiently thick so that the part of said first layer located layer away from said interior of said container has greater stiffness than said interior surface of said first layer when said first layer is in close proximity to said oil; and

(B) a second substantially continuous layer occurring at the portion of said part of said wall wherever said first layer occurs and being located, at said portion, toward the exterior of said container from said first layer, said second layer having less stiffness than said part of said first layer located away from said interior of said container.

5,814,384

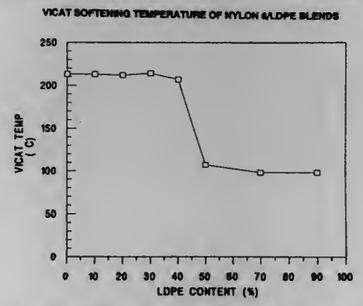
ARTICLES OF MANUFACTURE COMPRISING EXTRUDED POLYAMIDE-LOW DENSITY POLYETHYLENE GRAFT BLENDS

Murali K. Akkapeddi, Morristown; Sengshiu Chung, Parsippany, and Michael P. May, Sparta, all of N.J., assignors to AlliedSignal, Inc., Morris Township, N.J.

Continuation of Ser. No. 500,025, Jul. 10, 1995, abandoned, which is a continuation of Ser. No. 262,127, Jun. 17, 1994, abandoned. This application Dec. 13, 1996, Ser. No. 764,165

Int. Cl.[6] C08L *77/00*

U.S. Cl. 428—35.7 **19 Claims**



1. A flexible, extruded article having high heat resistance and solvent resistance, said article formed from a polymeric blend comprised of:

(a) about 50 to about 80% by weight, based upon the total weight of the blend, of at least one polyamide;

(b) about 1 to about 50% by weight, based upon the total weight of the blend, of a low density polyethylene functionalized with a moiety selected from the group consisting of a carboxylic acid and an anhydride; and

(c) about 20 to about 49% by weight, based upon the total weight of the blend, of an unfunctionalized low density polyethylene having a density between about 0.85 and about 0.95 g/cm^3, wherein said blend has a melt index between about 1 and about 5 g/10 minutes at 235° C. under a load of 1 kg.

5,814,385

LAMINATED POLYESTER FILM TO BE LAMINATED ONTO METAL PLATE

Takeo Asai, Sagamihara; Kinji Hasegawa, Hachioji, and Mitsumasa Ono, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP94/01185, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO96/02387, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 19, 1994, Ser. No. 617,759

Int. Cl.[6] B32B *1/02;15/08;27/08;27/36*

U.S. Cl. 428—35.8 **16 Claims**

1. A laminated polyester film to be laminated onto metal plate, characterized in that the film comprises:

(A) a first layer which comprises:

a first aromatic copolyester composed of terephthalic acid and isophthalic acid as the main dicarboxylic acid components and ethylene glycol as the main glycol component, said first aromatic copolyester containing isophthalic acid in an amount of 5 to 19 mole % based on the total amount of the dicarboxylic acid components and having a melting point of 210° to 245° C., and

first inert fine particles having an average particle diameter of 0.05 to 0.6 μm in an amount of 0.01 to 3% by weight,

said first layer having a surface roughness (Ra) of 2 to 13 nm; and

(B) a second layer which comprises:

a second aromatic copolyester composed of ethylene terephthalate as the main recurring unit and having a melting point of 210° to 252° C., or a melt-blend product consisting of 60% by weight or more of said second aromatic copolyester and 40% by weight or less of a third aromatic polyester composed of tetramethylene terephthalate as the main recurring unit and having a melting point of 180° to 223° C., and

second inert fine particles having an average particle diameter of 0.03 to 2.5 μm in an amount of 30% by weight or less,

said second layer having a surface roughness (Ra) of at least 15 nm.

5,814,386

COMPOSITE SHELL FORMED AS A BODY OF ROTATION, AND METHOD AND MANDREL FOR MAKING SAME

Valery Vitalievich Vasiliev; Vladimir Alexandrovich Bunakov, both of Moscow; Alexandr Fredeorovich Razin, and Mikhail Sergeevich Artjukhov, both of Moskovskaya, all of Russian Federation, assignors to McDonnell Douglas Corporation, Huntington Beach, Calif., and Crismb-Cat, Moscow, Russian Federation

Filed Nov. 25, 1996, Ser. No. 756,230

Claims priority, application Russian Federation, Dec. 1, 1995, 95120432

Int. Cl.[6] B32B *1/08*

U.S. Cl. 428—36.3 **6 Claims**

1. A load-carrying tube shell in the form of a body of revolution made of composite materials and comprising:

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a supporting framework of spiral and annular stiffening ribs which intersect to define a cellular structure, the supporting framework further including transitional stiffening ribs extending between the annular stiffening ribs, the stiffening ribs being formed of a plurality of layers, each layer including spiral and annular strips crossing each other and transitional strips extending between adjacent annular strips, the layers being repeated over the thickness of the framework, the stiffening ribs further including damping-absorbing layers of resilient-elastic material having a high sound wave damping decrement interposed between adjacent layers of the spiral, annular, and transitional strips; and

a substantially continuous outer layer covering the supporting framework, the outer layer being formed of unidirectional filaments bound by a cured polymeric binder, the filaments of the outer coating layers being disposed at an angle of 80° to 90° with respect to the axis of symmetry of the shell.

5,814,387

RUBBER BAND FOR REPAIRS AND METHOD THEREFOR

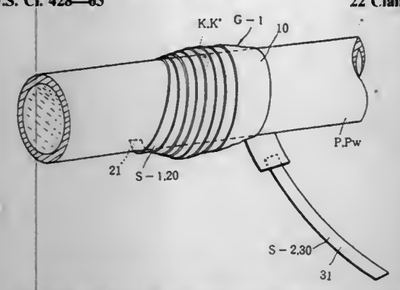
Seiichi Orihara, and Yoshiji Orihara, both of Tokyo, Japan, assignors to Orihara Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1996, Ser. No. 585,468

Claims priority, application Japan, Jan. 24, 1995, 7-27192; Sep. 6, 1995, 7-252045

Int. Cl.[6] F16L *55/168*

U.S. Cl. 428—63 **22 Claims**



1. A rubber band for pipe repairs to be wound about a portion of the pipe having a leak through which fluid such as liquid or gas is leaking, said rubber band comprising:

a main body comprising a substantially flat strap composed of a rubber material;

tentative fixing means, which is windable around the pipe, attached to an end of said main body, for tentatively fixing said substantially flat strap on the pipe, the tentative fixing means comprising at least one of an adhesive tape and a face to face fastener comprising a male member fixed to a face of the substantially flat strap and a female member fixed on an other face of the substantially flat strap; and

retaining means attached to an other end of said main body to prevent said substantially flat strap from loosening around the pipe.

5,814,388

SCRUBBING DEVICE COMPRISES A WOVEN SCRIM AND ABSORBENT BODY

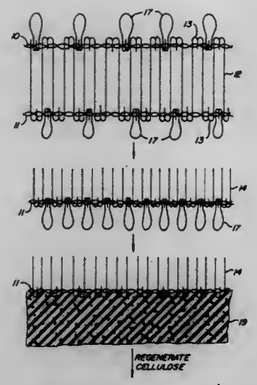
Michael C. Fryan, Livermore, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Sep. 22, 1995, Ser. No. 532,532

Int. Cl.[6] A47K *7/02;* **B32B** *3/02*

U.S. Cl. 428—95 **12 Claims**

1. A scrubbing device having scouring surface comprising an absorbent porous body comprising regenerated cell cellulose



sponge having a woven web superimposed upon and cofacially affixed to at least a portion of said absorbent body; said woven web comprising a woven backing and pile fibers interwoven into said backing wherein said pile fibers form ends extending from said backing to form said scouring surface of said device; and further comprising thread interwoven into said backing to form loops which project from said backing in the direction cofacial to said absorbent body and said loops are embedded into said absorbent body to anchor said woven web thereto.

5,814,389

APERTURED THREE-DIMENSIONAL PRODUCT IN MEMBRANE OR FILM FORM FOR COVERING SANITARY, DISPOSABLE ABSORBENT PRODUCTS

Claudio Giacometti, Pistoia, Italy, assignor to Pantex, S.r.l., Pistoia, Italy

Continuation of Ser. No. 399,572, Mar. 6, 1995, abandoned, which is a division of Ser. No. 151,562, Nov. 12, 1993, abandoned. This application Jul. 8, 1996, Ser. No. 676,918

Claims priority, application European Pat. Off., Nov. 17, 1992, 92830624

Int. Cl.[6] B32B *3/24;* **A61F** *13/46*

U.S. Cl. 428—132 **5 Claims**

1. A web or film product comprising a web or film having a plurality of perforations formed in said web or film and passing through said web or film, wherein material of the web or film which has been removed to form each of said perforations is partially detached from remaining material of said web or film and forms a strand extending from one surface of said web or film, wherein the material removed to form said strand is plastically deformed, the material of the web or film is thicker in a portion of a perimeter of each perforation where said strand is connected to said remaining material than in a portion of a perimeter of each perforation where said strand is detached from said remaining material, and each strand formed projects over a portion of a corresponding perforation.

5,814,390

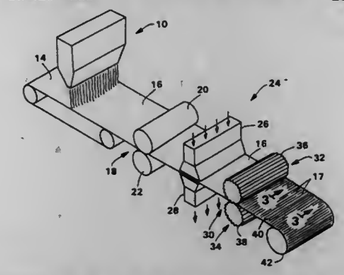
CREASED NONWOVEN WEB WITH STRETCH AND RECOVERY

Ty Jackson Stokes, Suwanee; Jon Richard Butt, Sr., and Alan Edward Wright, both of Woodstock, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 30, 1995, Ser. No. 497,484

Int. Cl.[6] D06C *7/02;27/00;* **D06J** *1/04;* **A41B** *7/00;* **B32B** *3/30*

U.S. Cl. 428—181 **26 Claims**



1. Nonwoven fabric having heat set creases of at least 2 per centimeter measured orthogonal to the creases lines and a bulk of at least 1.5 times the thickness of the base web, said nonwoven fabric having a recovery of at least 35% when subjected to 300 g stretch test in a direction orthogonal to the crease lines, said nonwoven fabric having been formed from a nonelastic olefin polymer based thermoplastic fiber-comprising precursor web.

5,814,391

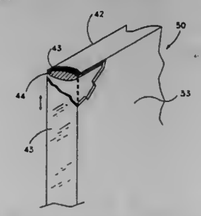
THERMOPLASTIC STRUCTURAL PIECE CONTAINING INJECTION MOLDED PORTION

Herbert Hutchison, Gahanna; Paul R. Pelfrey, Pickerington, and Byron Rose, Williamsport, all of Ohio, assignors to Crane Plastics Company Limited Partnership, Columbus, Ohio

Continuation of Ser. No. 343,716, Nov. 22, 1994, abandoned. This application Jan. 3, 1996, Ser. No. 582,458

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—195 **9 Claims**



1. A polymeric extrudate panel having a resiliently sealed gap, said panel comprising:

a) a first stationary panel portion of a relatively rigid polymeric material having a substantially flat attachment surface, a front it surface and a first gap edge, and a second stationary panel portion of a relatively rigid polymeric material having a substantially flat attachment surface, a front surface and a second gap edge, said panel portions attached so as to be positioned beside one another and aligned so that said first gap edge is aside said second gap edge, forming a gap, each of said panel portions having a gap edge adjacent said gap;

b) an extension portion, injection molded onto and extending from each of said gap edges, so as to cover said gap, and said extension portions being of a material relatively flexible compared to said relatively rigid polymeric material so as to form a resiliently closing passageway through said gap, said extension portions capable of being flexed from a first position wherein said extension portions cover said gap to a second position opening said gap.

5,814,392

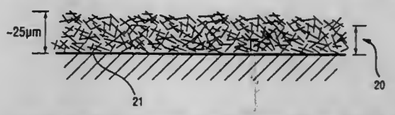
BOILING ENHANCEMENT COATING

Seung Mun You, Arlington, and John P. O'Connor, Ft. Worth, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 216,884, Mar. 23, 1994. This application Dec. 2, 1996, Ser. No. 716,227

Int. Cl.[6] B32B *15/08;* **C08K** *3/00*

U.S. Cl. 428—209 **44 Claims**



1. A composition comprising cavity-generating particles, a glue and a solvent, wherein said glue adheres to said particles and is soluble in said solvent, the particle/glue ratio being 2–15 g/ml glue and the solvent being about 85–98% of the composition.

35. An object to be immersed in a liquid coolant having a surface comprising cavity-generating particles of less than 50 μm in size affixed by a glue such that boiling nucleation sites of 05 μm to 10 μm width are formed in a density increasing critical heat flux of the surface.

5,814,393

FLEXIBLE PRINTED CIRCUIT

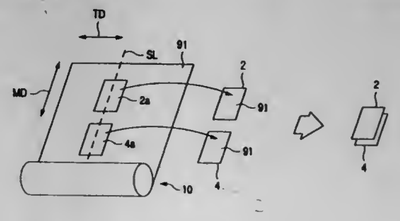
Chiharu Miyaake; Toshihiko Sugimoto, and Yousuke Miki, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Oct. 18, 1996, Ser. No. 734,454

Claims priority, application Japan, Oct. 19, 1995, 7-271535; Jan. 11, 1996, 8-003358

Int. Cl.[6] B32B *3/00;* **H05K** *1/00*

U.S. Cl. 428—209 **20 Claims**



1. A composite sheet comprising:

a first resin film;

a second resin film laminated on the first resin film so that a surface of the first resin film faces a rear face of the second resin film; and

a metal electric circuit formed between the first and second resin films, the metal electric circuit having a plastic deformation component, which is measured after a stress load is imposed to a strain of 0.002 (mm/mm) and removed from the metal electric circuit, of at least 0.0003 (mm/mm);

wherein the first and second resin films have substantially the same shape as one another and are cut out from two areas of a plastic film sheet which is stretched in both a machine direction and a transverse direction, and the two areas are mutually aligned in orientation such that an arbitrary point of one of the two areas and a point on the other area corresponding to the arbitrary point are located on the plastic film sheet

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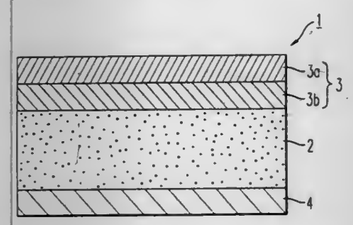
on an arbitrary standard line which is parallel with the machine direction of stretch.

5,814,394

MAGNETIC RECORDING MEDIUM

Akira Ishikawa; Hidehiko Nakayama, and Kazutaka Yamashita, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 7, 1996, Ser. No. 597,961
Claims priority, application Japan, Feb. 7, 1995, 7-019228; Oct. 30, 1995, 7-281239
Int. Cl.[6] G11B *5/716*
U.S. Cl. 428—212 5 Claims



1. A magnetic recording medium comprising a support having thereon a plurality of magnetic layers comprising a first magnetic layer provided as an uppermost layer and a second magnetic layer provided adjacent to said first magnetic layer,

wherein said first and second magnetic layers each comprises a magnetic powder and a binder containing a polar group substituted vinyl chloride resin and/or cellulose resin,

said magnetic powder is a spinel or a tabular hexagonal ferrite powder,

the binder contents in said first magnetic layer an d said second magnetic layer satisfy the relationship defined by the following equation (1), and

the contents of said vinyl chloride resin and said cellulose resin in said first magnetic layer and said second magnetic layer satisfy the relationship defined by the following equation (2):

$$0.6 \leqq (A-B)/B \leqq 6 \quad (1)$$

$$0.4 \leqq (C-D)/D \leqq 11 \quad (2)$$

wherein A represents the ratio of the binder content in said second magnetic layer to the magnetic powder content in said second magnetic layer; B represents the ratio of the binder content in said first magnetic layer to the magnetic powder content in said first magnetic layer; C represents the ratio of the total content of the vinyl chloride resin and cellulose resin in said second magnetic layer to the magnetic powder content in said second magnetic layer; and D represents the ratio of the total content of the vinyl chloride resin and said cellulose resin in said first magnetic layer to the magnetic powder content in said first magnetic layer,

wherein the thickness of said first magnetic layer is from 0.05 to 1.0 μm, and the thickness of said second magnetic layer is from 0.5 to 2.5 μm,

the total amount of binders in the first magnetic layer is from 5 to 40 parts by weight based on 100 parts by weight of the magnetic powder, and

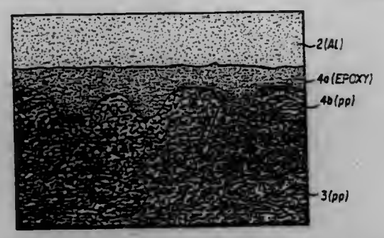
wherein said binder also comprises a sulfo-group substituted polyurethane hardened with a hardener in an amount of 5 to 60% by weight based on the total weight of the binder.

5,814,395

METAL-POLYPROPYLENE-METAL LAMINATE AND METHOD OF MAKING A SHAPED SHEET ARTICLE OF SUCH A LAMINATE

Maria E. Soellaart-Roelofsen, Oostzaan, and Jan Bottema, Santpoort-Zuid, both of Netherlands, assignors to Hoogovens Hylite BV, Ijmuiden, Netherlands

Continuation of Ser. No. 145,109, Nov. 3, 1993, abandoned.
This application Jun. 30, 1995, Ser. No. 497,701
Claims priority, application Netherlands, Nov. 11, 1992, 9201968
Int. Cl.[6] B32B *7/02*
U.S. Cl. 428—213 15 Claims



1. Metal-polypropylene-metal laminate, suitable for cold-forming followed by treatment at a temperature of at least 135° C., comprising

(a) two metal sheets made from one of the metals selected from the group consisting of aluminum and steel and each metal sheet having a thickness in the range of from 0.08 to 0.3 mm;

(b) a polypropylene core sandwiched between said metal sheets and having a thickness in the range of from 0.5 to 2 mm, said core being made of a polypropylene having at 135° C. a yield stress of not less than 2 MPa; and

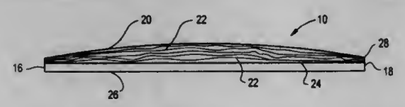
(c) a bonding primer effecting adhesion of said core to said metal sheets on each side; said bonding primer comprising an epoxy resin component and a polypropylene component, said epoxy resin component of the binding primer being cured on the metal sheets before the metal sheets are laminated to the polypropylene core and the components of the binding primer forming an interface comprising a sinuous interface between the metal sheets and the polypropylene core.

5,814,396

GREASE ABSORBING PAD

Ron J. Weidner, 7016 Johnsonburg Rd., Spring Grove, Ill. 60081, and John C. Miller, 32 Deer Point Dr., Hawthorn Woods, Ill. 60047

Filed Aug. 2, 1996, Ser. No. 691,485
Int. Cl.[6] B32B *23/08*
U.S. Cl. 428—213 3 Claims



1. A disposable three layered pad for collecting cooking grease produced during the cooking of fattly foods in the bottom cooking area of a microwave oven comprising:

a) a top grease absorbing layer having at least one ply of a grease absorptive sheet;

b) a middle grease and high temperature resistant plastic layer; and,

c) a bottom layer composed of an anti-stick, heat insulating sheet: with the pad being dimensioned to cover a substantial portion of the bottom cooking area of a microwave oven and, with the top layer being from 2 to 50 times thicker than the middle and bottom layers.

5,814,397

METHOD FOR WATERPROOFING CERAMIC MATERIALS

Domenick E. Cagliostro, Berkeley, and Ming-Ta S. Hsu, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 13, 1995, Ser. No. 537,585
Int. Cl.[6] B64C *1/40;* B32B *5/18;18/00*
U.S. Cl. 428—216 33 Claims

31. A waterproofed, porous and flexible thermal insulating material having an exterior and an interior surface and comprising at least one material from the group consisting of fabric, batting, fiber and felt made of at least one member from the group consisting of ceramic fiber, thread and filament, wherein exterior and interior surfaces are coated with a silica coating less than one micron thick and wherein said silica coated surfaces are coated with a coating less than one micron thick of a silicon containing waterproofing agent.

5,814,398

IN SITU VEHICLE BED LINER AND METHOD OF FORMING SAME

Michael L. Kronz; Joseph G. Fabick, Jr., both of Madison, and Kara L. Traxler, Merrimac, all of Wis., assignors to Fabick, Inc., Madison, Wis.

Filed Mar. 22, 1996, Ser. No. 620,920
Int. Cl.[6] C08G *18/10*
U.S. Cl. 428—338 20 Claims

1. A method of forming a vehicle bed liner in situ comprising the steps of:

(a) providing a polymer composition selected from the group consisting of polyurethane, polyurea and polyurethane/polyurea;

(b) providing a vehicle bed having sides and a floor, the floor having a proximate first edge and a distal second edge;

(c) applying the composition directly to the sides of the vehicle bed to form a liner;

(d) pouring the composition directly onto the floor of the vehicle bed creating a floor layer of the vehicle bed liner which is tapered and has a minimum thickness of one eighth inch at the first edge of the floor of the vehicle bed and a minimum thickness of one half inch at the second edge of the floor of the vehicle bed; and

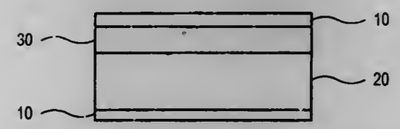
(e) curing the liner on the vehicle bed.

5,814,399

STRETCH WRAP FILMS

George Elchbauer, Fairport, N.Y., assignor to Tenneco Packaging, Evanston, Ill.

Filed Mar. 12, 1996, Ser. No. 614,380
Int. Cl.[6] B32B *7/02;27/32*
U.S. Cl. 428—220 66 Claims



1. A multilayer, thermoplastic stretch wrap film containing at least four polymeric film layers, comprising:

(a) a first outer polymeric film layer comprising a polymer of two or more monomers, wherein a first monomer is ethylene, in a major amount by weight, and a second monomer is an alpha olefin of from about 3–12 carbon atoms, in a minor amount by weight;

(b) a second outer polymeric film layer comprising a polymer of two or more monomers, wherein a first monomer is ethylene, in a major amount by weight, and a second monomer is an alpha olefin of from about 3–12 carbon atoms, in a minor amount by weight, said first and said second outer film layers having a cling force to each other of at least about 140 grams/inch as determined by ASTM D5458-94;

(c) a puncture resistant, inner polymeric film layer, located between said first and second outer layers, said puncture resistant layer comprising at least 40 weight percent of a polyethylene copolymer or terpolymer resin, said polyethylene resin having a polydispersity of from 1 to 4, a melt index of from 0.5 to 10g/10 min., and a melt flow ratio (I_{20}/I_2) of from 12 to 22; and

(d) a tear resistant, inner polymeric film layer, located between said first outer layer and said puncture resistant inner layer, said tear resistant layer constructed with a resin that produces a film having a higher transverse direction tear resistance than a film produced by the resins used to construct said puncture resistant film layer and said first and second outer film layers;

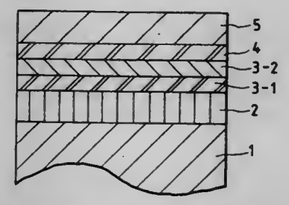
wherein said stretch wrap film has a transverse direction tear resistance of at least 500 g/mil, a machine direction tear resistance of at least about 175 g/mil, and a F-50 dart drop value of at least 150 g/mil as determined by ASTM D1709.

5,814,400

MAGNETO-OPTICAL RECORDING MEDIUM AND METHOD

Fumiyoshi Kirino, Suginami-ku; Yoshinori Miyamura, Nishitama-gun; Junko Nakamura, Higashimatsuyama; Norio Ohta, Moriya; Masahiko Takahashi, and Ryo Suzuki, both of Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Maxell, Ltd., Osaka-fu, both of Japan

Filed May 20, 1991, Ser. No. 702,936
Claims priority, application Japan, May 18, 1990, 2-126784; Jun. 20, 1990, 2-159782; Sep. 21, 1990, 2-250272; Sep. 21, 1990, 2-250273
Int. Cl.[6] G11B *5/66*
U.S. Cl. 428—332 41 Claims



1. A magneto-optical recording medium comprising in combination:

a magneto-optical recording layer capable of writing or erasing information by a laser beam and an external magnetic field and of reading the information by a Kerr effect; and

a substrate having the magneto-optical recording layer formed thereon;

characterized in that:

the magneto-optical recording layer has at least two layers including a first magneto-optical recording layer and a second magneto-optical recording layer which are magnetically coupled together;

the first magneto-optical recording layer is a layer providing a greater magneto-optical effect in a short light wavelength range than the second magneto-optical recording layer though that having less perpendicular magnetic energy than this, as is provided on an irradiation side of the laser beam;

the first magneto-optical recording layer is not thicker than 500 Angstrom and is provided adjacent the substrate, and the second magneto-optical recording layer is provided on the first magneto-optical recording layer; and

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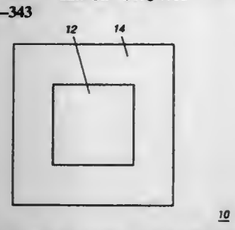
the first and second magneto-optical recording layers are thick in total not to transmit the light in use for reading.

5,814,401

SELECTIVELY FILLED ADHESIVE FILM CONTAINING A FLUXING AGENT

Daniel R. Gamota, Palatine, Ill.; Robert W. Pennisi, Boca Raton, Fla., and Cynthia M. Melton, Bollingbrook, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1997, Ser. No. 794,826
Int. Cl.[6] C09J *7/02*
U.S. Cl. 428—343 **23 Claims**



1. A selectively filled thermally curable adhesive film containing a fluxing agent for reflow soldering an electronic device to a substrate, comprising:

an adhesive film having a central region and a boundary region surrounding the central region;

the boundary region consisting of a first adhesive and a fluxing agent;

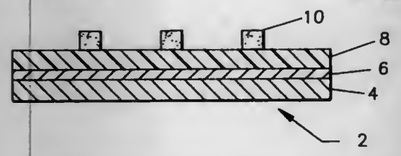
the central region comprising a second adhesive and an inert filler, said inert filler having a co-efficient of thermal expansion value less than one-half of the co-efficient of thermal expansion value of the second adhesive.

5,814,402

PRESSURE SENSITIVE DRY TRANSFER GRAPHICS ARTICLE AND METHOD OF MANUFACTURE

John Ralph Smith, Gansevoort, N.Y., assignor to Decora Incorporated, Fort Edward, N.Y.

Filed Apr. 20, 1993, Ser. No. 50,511
Int. Cl.[6] B32B *7/12*
U.S. Cl. 428—354 **16 Claims**



4. A pressure sensitive dry transfer graphics article for application to a bonding substrate comprising:

a) a backing film comprising a first face and a second face;

b) a release coating applied to said first face of said backing film;

c) a continuous film of brittle polymeric compound applied to said release coating; and

d) a pigmented pressure sensitive adhesive coating applied in imagewise fashion to said polymeric film to form a graphic pattern;

whereby, upon application of said pressure sensitive dry transfer graphics article to the bonding substrate by pressure applied to the areas defined by said graphic pattern, said pigmented pressure sensitive adhesive is transferred to the bonding substrate and, after peeling said article away from said bonding substrate, said polymeric film fractures along the borders defining said graphic pattern such that the polymeric film in union with said graphic pattern is transferred with said pressure sensitive adhesive to the bonding substrate and the polymeric film not in union with said graphic pattern remains with said release coating.

5,814,403

COMPOSITES AND METHODS OF MAKING THE SAME

Michael P. Anderson, Gillette; Liza M. Monette, Flemington; John P. Dismukes, Annandale; Shiun Ling, Somerville, all of N.J., and David J. Srolovitz, Ann Arbor, Mich., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 756,719, Sep. 9, 1991, abandoned. This application Jan. 28, 1993, Ser. No. 10,619
Int. Cl.[6] D02G *3/00;* **B32B** *9/00*
U.S. Cl. 428—357 **31 Claims**

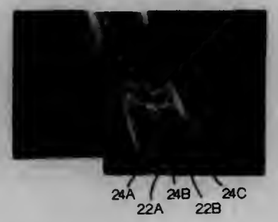
1. A discontinuous-fiber composite comprising fibers of finite length formed from a fiber material having intrinsic elastic modulus $E_{f,int}$ and intrinsic cohesive energy $U_{f,int}$ dispersed in a matrix of a matrix material having an intrinsic elastic modulus $E_{m,int}$ and intrinsic cohesive energy $U_{m,int}$, whereby said intrinsic elastic moduli and cohesive energies of said materials define an intrinsic nodal model critical aspect ratio $S_{c,nm,int}$, said fibers having apparent elastic modulus $E_{f,app}$ and apparent cohesive energy $U_{f,app}$, said matrix having apparent elastic modulus $E_{m,app}$ and apparent cohesive energy $U_{m,app}$, whereby said apparent elastic moduli and apparent cohesive energies define an apparent nodal model critical aspect ratio $S_{c,nm,app}$, at least one of said matrix and said fibers incorporating physical means for adjusting at least one of its apparent elastic modulus and cohesive energy to a value different than the corresponding intrinsic value so that $S_{c,nm,app}$ is less than $S_{c,nm,int}$.

5,814,404

DEGRADABLE MULTILAYER MELT BLOWN MICROFIBERS

Denise R. Rutherford, Oakdale, and Eugene G. Joseph, Vadnais Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 3, 1994, Ser. No. 253,690
Int. Cl.[6] D07G *3/00*
U.S. Cl. 428—364 **23 Claims**



1. Multilayer melt blown microfibers comprising

(a) at least one layer of polyolefin resin and at least one layer of polycaprolactone resin, at least one of the polyolefin or polycaprolactone resins containing a transition metal salt; or

(b) at least one layer of polyolefin resin containing a transition metal salt and at least one layer of a degradable resin or transition metal salt-free polyolefin resin.

5,814,405

STRONG, AIR PERMEABLE MEMBRANES OF POLYTETRAFLUOROETHYLENE

Phillip A. Branca, Hockessin, Del.; Daniel E. Hubis, Elkton, Md.; Wolfgang Buerger, Munich, Germany; Christiane Rudolf, Erding, Germany, and Ralf Tillmanns, Pleinfeld-Ramsberg, Germany, assignors to W. L. Gore & Associates, Inc., Newark, Del., and W. L. Gore & Associates, GmbH, Putzbrunn, Germany

Filed Aug. 1, 1996, Ser. No. 690,924
Claims priority, application Germany, Dec. 1, 1995, 195 44 912.6
Int. Cl.[6] B29C *55/02;* **B32B** *5/26;* **D04H** *13/00*
U.S. Cl. 428—311.51 **16 Claims**

1. A microporous polytetrafluoroethylene article having an internal microstructure consisting essentially of a series of nodes interconnected by fibrils, said nodes generally aligned in parallel, being highly elongated and having an aspect ratio of 25:1 or greater.

16. A process for preparing a porous polytetrafluoroethylene article which comprises the steps in sequence of.

(a) lubricating and paste extruding at least one polytetrafluoroethylene fine powder resin to provide a tape extrudate;

(b) removing lubricant;

(c) stretching the extrudate at least uniaxially at a temperature below the crystalline melting point the lowest melting polytetrafluoroethylene component;

(d) amorphously locking the stretched tape by raising the temperature of the tape to above the crystalline melting point of the highest melting polytetrafluoroethylene component;

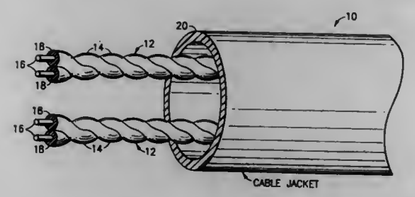
(e) stretching at a temperature above the crystalline melting point of the highest melting polytetrafluoroethylene component, in at least the direction orthogonal to the direction of greatest original stretch.

5,814,406

COMMUNICATION CABLE FOR USE IN A PLENUM

Kerry Newmoyer, Denver, Pa., assignor to Alcatel NA Cable Systems, Inc., Claremont, N.C.

Continuation of Ser. No. 569,847, Dec. 8, 1995, abandoned. This application Aug. 13, 1997, Ser. No. 910,311
Int. Cl.[6] B32B *15/00*
U.S. Cl. 428—379 **25 Claims**



1. A communication cable for use in a plenum, said cable comprising:

a plurality of twisted pairs of electrical conductors, each of said electrical conductors of said plurality of twisted pairs having a surrounding layer of electrical insulation formed from a flame retardant modified olefin base material; and

a jacket surrounding said plurality of twisted pairs of electrical conductors;

wherein said communication cable does not contain any twisted pairs in addition to said plurality of twisted pairs, and wherein said plurality of twisted pairs contains twisted pairs coated only with said flame retardant modified olefin base material.

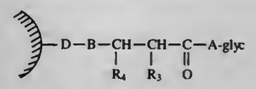
5,814,407

GLYCOSYLATED PARTICLE OF LATEX OR OF INORGANIC OXIDE AND PROCESS FOR THE PREPARATION THEREOF

Joel Richard, Chantilly; Sophie Vaslin, Bry-sur-Marne, and Chantal Larpent, Versailles, all of France, assignors to Societe Prolabo, Fontenay-Sous-Bois, France

Filed Oct. 30, 1995, Ser. No. 550,371
Claims priority, application France, Oct. 28, 1994, 94 12970
Int. Cl.[6] B01J *2/30;13/00;* **B05D** *3/10;* **B32B** *5/02*
U.S. Cl. 428—404 **11 Claims**

1. A particle of latex or of inorganic oxide, in which at least one chain, to the end of which a glycosyl residue is attached, is bound to the surface of said particle, which comprises at the surface amine, thiol and phenol functional radicals and silanol sites in the case of silica particles, at least a proportion of which forms part of the structure of said chain, the latter corresponding to the formula:



A is the remaining part of said chain,

B is selected from the group consisting of N—R_1 radicals, an oxygen atom and a sulfur atom,

D is a divalent —$(CH_2)_n$— or phenylene radical,

R_1 is a C_1–C_4 alkyl radical or a hydrogen atom,

R_3 and R_4, which are identical or different, denote a C_1–C_6 lower alkyl radical or a hydrogen atom,

n is an integer from 0 to 10,

glyc is a glycosyl residue, and

symbolizes the surface of the sphere.

5,814,408

ALUMINUM MATRIX COMPOSITE AND METHOD FOR MAKING SAME

Jyh-Ming Ting, Fairborn, and Max Laverne Lake, Yellow Springs, both of Ohio, assignors to Applied Sciences, Inc., Cedarville, Ohio

Filed Jan. 31, 1996, Ser. No. 594,588
Int. Cl.[6] B32B *9/08;9/17;9/14*
U.S. Cl. 428—408 **12 Claims**

1. An aluminum matrix composite comprising:

a preform comprising interwoven mats of graphitized vapor grown carbon fibers, said preform having interstices therein which have been infiltrated with aluminum.

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5,814,409

EXPANDED FLUORINE TYPE RESIN PRODUCTS AND A PREPARATION PROCESS THEREOF

Toshioki Hane, and Hisao Koike, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP94/01886, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO95/30711, PCT Pub. Date Nov. 16, 1995

Continuation of Ser. No. 578,694, Dec. 27, 1995, abandoned. This PCT application Nov. 9, 1994, Ser. No. 921,528

Claims priority, application Japan, May 10, 1994, 6-096279

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—421 18 Claims

1. An expanded product comprising a thermoplastic fluorine resin which does not have a cross-linking structure and has an expansion ratio of between 4-fold and 30-fold and a closed cell percentage of 40% or more, the expanded product which contains at least one interface comprising layers adjacent to each other having different cell densities and which has a distribution index (Sc) and a coefficient of variation (Cv) of the maximum diameter of an open cell present at an optional cross section of each layer of $0<Sc\leqq 6$ and $0<Cv\leqq 1$, respectively, which are represented by equations as follows:

$$Sc=(L_{Max.}-L_{Min.})/L_{av.} \quad (1)$$

$$Cv=SD/L_{av.} \quad (2)$$

wherein $L_{Max.}$, $L_{Min.}$ and $L_{av.}$ represent maximum, minimum and average values of maximum diameters of open cells, respectively and SD represents a standard deviation.

5,814,410

METHOD FOR PREPARING COLOR-CLEAR COMPOSITE COATINGS HAVING RESISTANCE TO ACID ETCHING

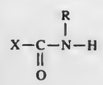
Debra L. Singer, Pittsburgh; Shanti Swarup, Gilsonia, and Michael A. Mayo, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 320,793, Oct. 7, 1994, which is a continuation of Ser. No. 968,795, Oct. 30, 1992, abandoned. This application Feb. 22, 1996, Ser. No. 605,420

Int. Cl.[6] B05D *1/36;7/16*

U.S. Cl. 428—423.1 22 Claims

1. A method for applying a composite coating to a substrate which comprises applying to the substrate a colored film-forming composition to form a base coat and applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat characterized in that the clear film-forming composition comprises (1) a polymer or oligomer containing a plurality of terminal or pendant groups of the structure:



Where X is -N or

and R is H or alkyl of 1—6 carbon atoms or R is bonded to X and forms part of a 5 or 6 membered ring; and (2) an aminoplast crosslinking agent containing methylol and/or methylol ether groups; said clear film-forming composition being crosslinkable through reaction of said pendant or terminal groups with said methylol and/or methylol ether groups; said clear film-forming composition being further characterized as having a calculated hydroxyl value less than 50 based on solid weight of said clear film-forming composition, excluding any hydroxyl functionality associated with N-methylol groups so as to result in a crosslinked coating which has urethane and/or urea crosslinks arising from said reaction of pendant or terminal groups with said methylol and/or methylol either groups.

5,814,411

WATER-REPELLENT WALLBOARD

James Hale Merrifield, Ballston Spa, and Donna Ann Riccio, Watervliet, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 639,536, Apr. 29, 1996, Pat. No. 5,618,627, which is a continuation of Ser. No. 301,289, Sep. 6, 1994, abandoned, which is a division of Ser. No. 959,307, Oct. 9, 1992, Pat. No. 5,366,810. This application Feb. 18, 1997, Ser. No. 800,430

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—447 4 Claims

1. A water-repellent wallboard formed from sheets of paper and an inorganic building material treated with a froth of a water-repellent composition comprising water, a frothing agent, a hydrogen siloxane fluid, and a high molecular weight silicone having a weight average molecular weight ranging from about 50,000 to about 300,000.

5,814,412

BASE AND SOLVENT-DECOMPOSED THERMOSETTING MOLDING WITH ALIPHATIC POLYESTER

Takahiko Terada, Nara, and Hiroshi Onishi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP95/00816, § 371 Date Dec. 21, 1995, § 102(e) Date Dec. 21, 1995, PCT Pub. No. WO95/29205, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 26, 1995, Ser. No. 578,572

Claims priority, application Japan, Apr. 27, 1994, 6-089599; Apr. 28, 1994, 6-091752

Int. Cl.[6] B32B *15/08*

U.S. Cl. 428—458 15 Claims

1. A molded structure comprising a molded portion made of a molding compound, integrally molded containing at least metals,

wherein at least part of the molding compound includes as a binder a thermosetting composition containing a thermosetting resin and an aliphatic polyester,

decomposition of the thermosetting composition is promoted by decomposition of the aliphatic polyester in a decomposing solution containing from about 0.1 to about 50% by weight of at least one base selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal oxides, alkaline earth metal oxides, alkali metal alkoxides and alkaline earth metal alkoxides, and at least one solvent comprising water, methanol, ethanol or ethylene glycol after the thermosetting composition is cured, and

the metals and the molding compound are separated.

5,814,413

MULTILAYER PROTECTIVE GARMENT FILM

Fred Beerwart, Columbus, Ind., assignor to Huntsman United Films Corporation, Salt Lake City, Utah

Filed Jun. 7, 1995, Ser. No. 478,196

Int. Cl.[6] B32B *27/32*

U.S. Cl. 428—516 14 Claims

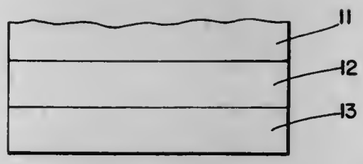
1. A multilayer coextruded polymer film, wherein each layer independently comprises:

(1) 20 to 100 percent by weight of a first polymer resin selected from the group consisting of a terpolymer of ethylene, butene and hexene produced using a metallocene single site catalyst, a copolymer of ethylene and hexene produced using a metallocene single site catalyst, a copolymer of ethylene and butene produced using a metallocene single site catalyst, ultra low density polyethylene, and very low density polyethylene; and

(2) 0 to 80 percent of a second polymer resin selected from the group consisting of low density polyethylene, linear low density polyethylene, ultra low density polyethylene, very low density polyethylene, a terpolymer of ethylene, butene and hexene produced using a metallocene single site catalyst which is different from that used as the first polymer resin, a copolymer of ethylene and hexene produced using a metallocene single site catalyst which is different from that used as the first polymer resin a copolymer of ethylene and butene produced using a metallocene single site catalyst which is different from that used as the first polymer resin, ethylene vinyl acetate and ethylene methyl acrylate;

wherein, if one layer comprises 100 percent of the first polymer resin, or the first polymer resin and second polymer resin are identical, then at least one of the other layers of the multilayer structure is a mixture of the first and second polymer resins; and

wherein multilayer coextruded polymer film has at least one textured outer layer.



5,814,415

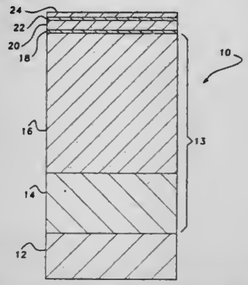
ARTICLE HAVING A DECORATIVE AND PROTECTIVE MULTILAYER COATING

Stephen R. Moysan, III, Douglasville, Pa., and Rolin W. Sugg, Avon, Conn., assignors to Baldwin Hardware Corporation, Reading, Pa.

Continuation of Ser. No. 13,913, Feb. 9, 1993, Pat. No. 5,641,579. This application Mar. 10, 1997, Ser. No. 815,983

Int. Cl.[6] B32B *15/04;15/20*

U.S. Cl. 428—627 34 Claims



1. An article comprising a metallic substrate having disposed on at least a portion of its surface a multi-layer coating comprising:

at least one layer comprised of nickel over said surface of said substrate;

a layer comprised of palladium over said layer comprised of nickel;

a layer comprised of palladium alloy over said layer comprised of palladium;

a layer comprised of zirconium or titanium over said layer comprised of palladium alloy;

and a layer comprised of zirconium or titanium compound over said layer comprised of zirconium or titanium.

5,814,414

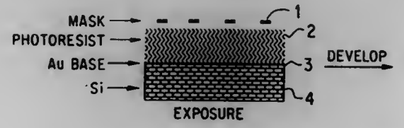
HIGH ASPECT RATIO METAL MICROSTRUCTURES AND METHOD FOR PREPARING THE SAME

Jacque H. Georger, Jr., Marlboro, Mass.; Martin C. Peckerar, Silver Spring; Milton L. Rebbert, Elkridge, both of Md.; Jeffrey M. Calvert, Alexandria, and James J. Hickman, McLean, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C., and Geo-Center, Inc., Newton Centre, Mass.

Continuation of Ser. No. 216,319, Mar. 23, 1994, abandoned, which is a division of Ser. No. 874,403, Apr. 27, 1992, Pat. No. 5,342,737. This application Feb. 15, 1996, Ser. No. 601,825

Int. Cl.[6] B21F *21/00;* B21G *1/08*

U.S. Cl. 428—586 7 Claims



1. A hollow metal microcylinder consisting of metal and having a length of 1 to 200 μm, an outer diameter of 0.25 to 30 μm, and an inner diameter of 0.25 to 30 μm.

5,814,416

WAVELENGTH COMPENSATION FOR RESONANT CAVITY ELECTROLUMINESCENT DEVICES

Ananth Dodabalapur, Millington; Timothy Mark Miller, New Providence, and Lewis Josiah Rothberg, Morristown, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Apr. 10, 1996, Ser. No. 630,237

Int. Cl.[6] H05B *33/00*

U.S. Cl. 428—690 20 Claims

LAYER	THICKNESS (nm)	INDEX OF REFRACTION
24 (Al)	100	(.83+i1.5) *
22 (Alq)	90	1.71
20 (TAD)	100	1.71
18 (ITO)	55	2.08
16 (FILLER-Si_xN_y)	60	1.92
14a, c, e (Si_xN_y)	62	2.20
14b, d, f (SiO_2)	92	1.50

*=REFLECTIVITY

1. An electroluminescent device, comprising:

a substrate having a surface with a multiplicity of predetermined regions, at least one of the regions comprising a symmetric, non-planar surface feature;

a first layer of reflective material disposed on said non-planar surface feature;

a second layer of reflective material; and

an active layer having organic material capable of electroluminescence disposed between said first and second reflective

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layers, said active layer and said reflective layers forming a microcavity structure.

5,814,417

ORGANIC ELECTROLUMINESCENT ELEMENT

Kenichi Nagayama, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 30, 1996, Ser. No. 689,127
Claims priority, application Japan, Aug. 8, 1995, 7-222514
Int. Cl.[6] B32B *9/02*
U.S. Cl. 428—690 **8 Claims**

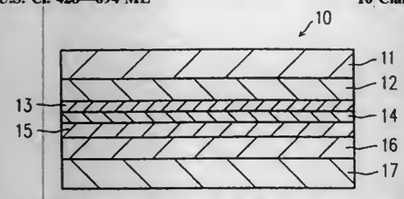
1. An organic electroluminescent element comprising:
a transparent substrate;
an anode formed on said substrate;
an emitting functional layer made of an organic material formed on said anode;
a cathode disposed on said emitting functional layer with a predetermined shape formed by a laser-material-processing of said electroluminescent element; and
a laser protective layer made of a heat-resistant thin film and disposed on at least a portion of said electroluminescent element provided with said laser-material-processing between said emitting functional layer and said anode.

5,814,418

MAGNETO-OPTICAL RECORDING MEDIUM AND METHOD FOR READING OUT INFORMATION FROM THE SAME

Keiji Nishikiori, Daito; Yasumori Hino, and Masahiro Birukawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 26, 1995, Ser. No. 534,182
Claims priority, application Japan, Sep. 27, 1994, 6-258783
Int. Cl.[6] G11B *5/66*
U.S. Cl. 428—694 ML **10 Claims**



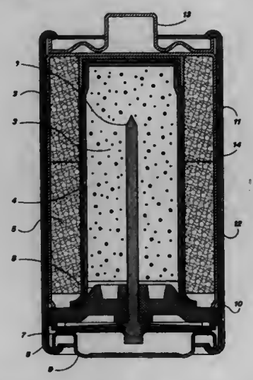
1. A magneto-optical recording medium comprising a substrate, and a recording layer structure including at least a readout magnetic film, a control magnetic film, and a recording magnetic film formed on the substrate,
wherein the recording magnetic film is a perpendicular magneto-anisotropy film which is magnetized by being irradiated with recording light so as to be heated and by being impressed with a recording magnetic field, on which information to be recorded is recorded and stored in the form of a magnetized direction of a domain,
the readout magnetic film is a perpendicular magneto-anisotropy film at a temperature in a predetermined range, and readout light is irradiated on the recording layer structure so that the magnetized direction of the domain of the recording magnetic film is copied onto the readout magnetic film to read out the recorded information,
the control magnetic film is provided between the readout magnetic film and the recording magnetic film so as to control working of an exchange-coupled force between the readout magnetic film and the recording magnetic film, the control magnetic-film being a perpendicular magneto-anisotropy film at a temperature in a predetermined range and an in-plane magneto-anisotropy film at a temperature in a range other than the predetermined range, and
information recorded on the recording magnetic film is copied onto the readout magnetic film through the control magnetic film by the exchange-coupled force in a region of the recording layer structure having a temperature at which the readout magnetic film and the control magnetic film are both perpendicular magneto-anisotropy films.

5,814,419

ALKALINE MANGANESE DIOXIDE ELECTROCHEMICAL CELL HAVING COATED CAN TREATED WITH SODIUM SILICATE

Kenneth Harry Kenyon, Verona, and Joseph L. Passaniti, Fitchburg, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Sep. 1, 1995, Ser. No. 522,849
Int. Cl.[6] H01M *6/08;2/02*
U.S. Cl. 429—165 **21 Claims**



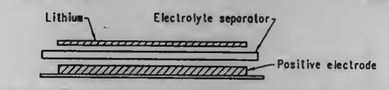
1. An alkaline electrochemical cell, comprising
(a) an unplated cylindrical steel container having an inner surface, a closed first end forming a bottom, an initially open second end, and upstanding sidewalls having an outer surface, the container forming a positive current collector, the inner surface having been treated with an aqueous solution of sodium silicate;
(b) a cylindrical annular cathode disposed within the container and comprising manganese dioxide, the cathode having outer peripheral sidewalls and inner peripheral sidewalls, the inner peripheral sidewalls forming a central cylindrically shaped void disposed therebetween;
(c) a cylindrical anode having an outer peripheral surface and comprising gelled zinc, the anode being disposed within the central cylindrically shaped void;
(d) an ionically permeable separator interposed between at least a portion of the outer peripheral surface of the anode and the inner peripheral sidewalls of the cathode;
(e) an alkaline aqueous electrolyte comprising potassium hydroxide, the electrolyte at least partially wetting the anode, the cathode, and the separator;
(f) a negative current collector electrically connected to the anode;
(g) a sealing disk disposed over the top of the initially open second end, the disk sealing inside the container the components disposed therewithin; the negative current collector extending through the sealing disk, and
(h) a conductive polymeric coating comprising a first film forming binder component and a second component comprising at least one of electrically conductive carbon and an electrically conductive filler, the film forming component of the coating being resistant to chemical reaction with the alkaline electrolyte, the coating being interposed between, and being in electrical contact with, both the outer peripheral sidewalls of the cathode and the inner surface of the container;
wherein the cell delivers more current in respect of another cell having otherwise identical construction but being untreated on the inner surface of its container with an aqueous solution of sodium silicate.

5,814,420

RECHARGEABLE POSITIVE ELECTRODES

May-Ying Chu, Oakland, Calif., assignor to PolyPlus Battery Company, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 686,609, Jul. 26, 1996, Pat. No. 5,686,201, which is a continuation-in-part of Ser. No. 479,687, Jun. 7, 1995, Pat. No. 5,582,623, which is a continuation-in-part of Ser. No. 344,384, Nov. 23, 1994, Pat. No. 5,523,179. This application Oct. 10, 1997, Ser. No. 948,892
Int. Cl.[6] H01M *4/36*
U.S. Cl. 429—104 **28 Claims**



Schematic of a Li/electrolyte separator/active –sulfur electrode cell

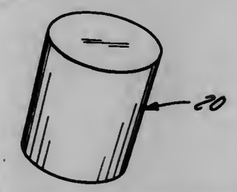
1. A battery cell comprising:
a) a negative electrode including a metal or an ion of the metal;
b) a positive electrode comprising
i) an electrochemically active material comprising sulfur in the form of at least one of elemental sulfur, a sulfide of the metal, and a polysulfide of the metal, and
ii) an electronically conductive material; and
c) a gel-state or polymeric solid-state electrolyte separator electronically separating the positive and negative electrodes,
d) wherein at least about 10% of the sulfur is accessible to electrons and ionic charge carriers.

5,814,421

METHOD AND APPARATUS FOR MAKING A BATTERY TERMINAL AND A BATTERY TERMINAL MADE THEREBY

Bernard N. Spiegelberg, Germantown, and Mark E. Sauter, Shorewood, both of Wis., assignors to Tulip Corporation, Milwaukee, Wis.

Filed Dec. 20, 1996, Ser. No. 771,282
Int. Cl.[6] H01M *2/30*
U.S. Cl. 429—178 **20 Claims**



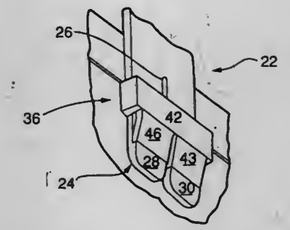
1. A method of manufacturing a battery terminal which includes a metal outer component having a bore therein, the bottom of which bore is closed, and an insert having an internally threaded hole therein, comprising:
A. placing the insert within the bore in the outer component, such that it rests on the closed end of the bore,
B. engaging the top edge of the outer component, which extends above the top surface of the insert with the operating head of a orbital head forming tool,
C. reforming, with the orbital head forming tool, the portion of the outer component which extends above the insert, such that the portion is formed in secure engagement with and overlaying the top surface of the insert and with a hole therein in alignment with the internally threaded hole in the insert.

5,814,422

LEAD-ACID BATTERY WITH HANDLE

William K. Vezina, Stillwater, Minn., assignor to GNB Technologies, Inc., Mendota Heights, Minn.

Filed Jul. 1, 1997, Ser. No. 886,263
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—187 **8 Claims**



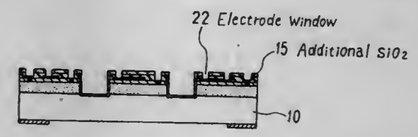
1. An electric storage battery comprising a container having side and end walls, a cover having opposed side and end walls attached to the respective side and end walls of the container, said container having handle attachment structure comprising a belt loop dimensioned to accept a handle and at least one spring pawl for engaging a handle, and a handle having a service and a rest position and having hook ends contained in said belt loop, said hook ends being sized and positioned to abut against said pawl in the service position, the handle and belt loop being dimensioned to restrict side-to-side movement of the handle.

5,814,423

TRANSMISSION MASK FOR CHARGED PARTICLE BEAM EXPOSURE APPARATUSES, AND AN EXPOSURE APPARATUS USING SUCH A TRANSMISSION MASK

Shigeru Maruyama; Hiroshi Yasuda, and Yoshihisa Ooaeh, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 30, 1996, Ser. No. 739,962
Claims priority, application Japan, Apr. 25, 1996, 8-105137
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **22 Claims**



1. A transmission mask for a charged particle beam exposure apparatus comprising:
a mask substrate having a first surface and a second surface, the first surface having a plurality of apertures arranged in a matrix and a pair of deflection electrodes provided at each aperture, the charged particle beam being irradiated to the plurality of apertures and being controlled by the deflection electrodes; and
a beam shield layer, having a reflectivity to the charged particle beam greater than the mask substrate, provided on the second surface of the mask substrate.

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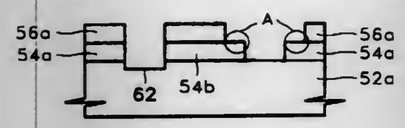
5,814,424

HALF TONE PHASE SHIFT MASKS WITH STAIRCASE REGIONS AND METHODS OF FABRICATING THE SAME

In-kyun Shin, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 5, 1997, Ser. No. 869,559
Claims priority, application Rep. of Korea, Jun. 29, 1996, 1996 25926
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 17 Claims



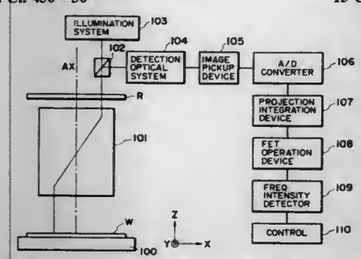
1. A phase shift mask comprising:
a phase shift mask substrate;
a phase shift region and an unshifted phase region in spaced apart relation on the phase shift mask substrate; and
a half tone region on the unshifted phase region, the half tone region changing a phase of radiation incident thereon between 0° and 180°.

5,814,425

METHOD OF MEASURING EXPOSURE CONDITION AND/OR ABERRATION OF PROJECTION OPTICAL SYSTEM

Yoshiharu Kataoka, and Tetsuya Mori, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 520,746
Claims priority, application Japan, Sep. 2, 1994, 6-209800
Int. Cl.[6] H01L *21/027*
U.S. Cl. 430—30 15 Claims



1. A method of measuring an exposure condition for transfer of a pattern having a periodicity in a direction, onto a photosensitive substrate, said method comprising:
a pattern forming step for transferring the pattern onto the photosensitive substrate plural times in different exposure conditions, to form photosensitive patterns on the photosensitive substrate;
an image picking-up step for picking up images of the photosensitive patterns;
an integrating step for integrating each image signal produced by said image picking-up step, within a two-dimensional window of predetermined size set with respect to each image signal and along one direction parallel to fringe directions in two-dimensional coordinates, to produce one-dimensional projection integration signals;
a transforming step for transforming, through Fourier transformation, each of the one-dimensional projection integration signals into a spatial frequency region; and
a determining step for determining an optimum exposure condition for transfer of the pattern onto the photosensitive substrate, on the basis of the frequency components, obtained by said transforming step, of each one-dimensional signal.

5,814,426

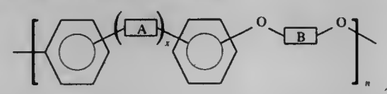
IMAGING MEMBERS CONTAINING HIGH PERFORMANCE POLYMERS

Timothy J. Fuller, Pittsford; Leon A. Teuscher, Williamsville; John F. Yanus, Webster; Damodar M. Pai, Fairport; Kathleen M. Carmichael, Williamson; Edward F. Grabowski, Webster, and Paul F. Zukoski, Henrietta, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1997, Ser. No. 976,004
Int. Cl.[6] G03G *5/05*
U.S. Cl. 430—96 17 Claims

1. An imaging member which comprises a conductive substrate, a photogenerating material, and a binder comprising a polymer selected from (a) those of the formulae

I



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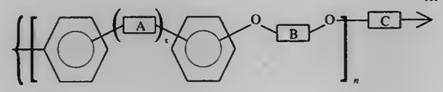

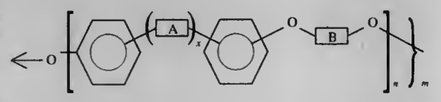

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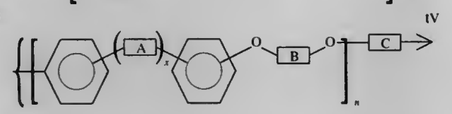

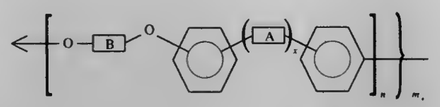

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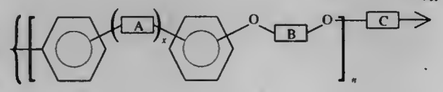

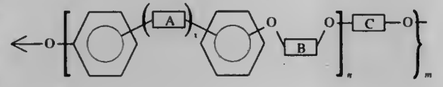

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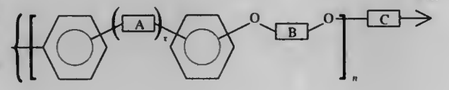

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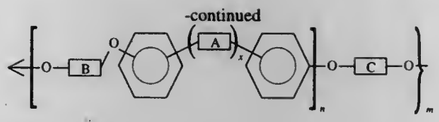
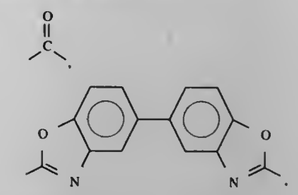
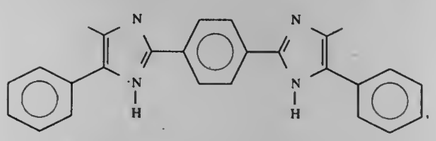
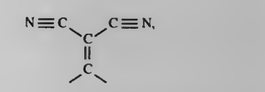
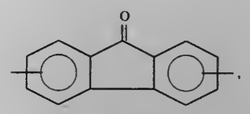


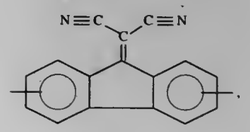
wherein x is an integer of 0 or 1, A is



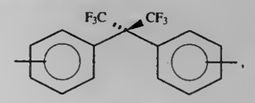


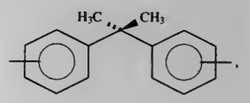






or mixtures thereof, B is





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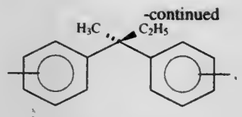
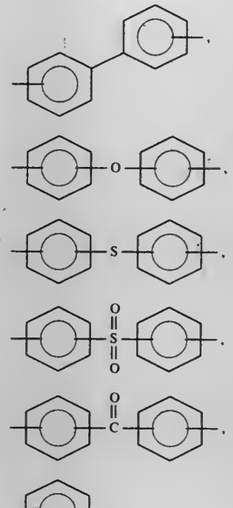
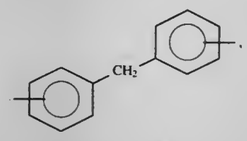
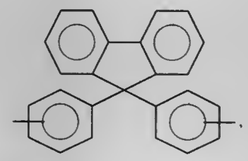


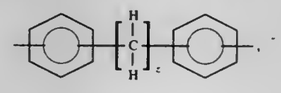






$+CH_2\frac{}{}_v$,

wherein v is an integer of from 1 to about 20,
$-(CH_2O)_t-$
wherein t is an integer of from 1 to about 20,



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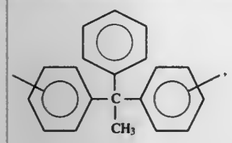
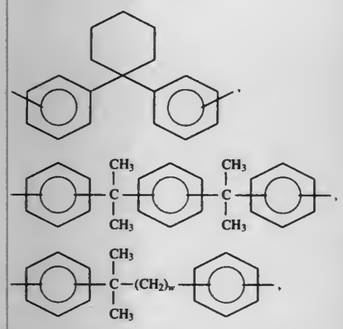
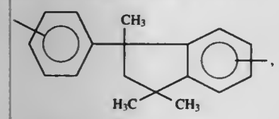
wherein z is an integer of from 2 to about 20,

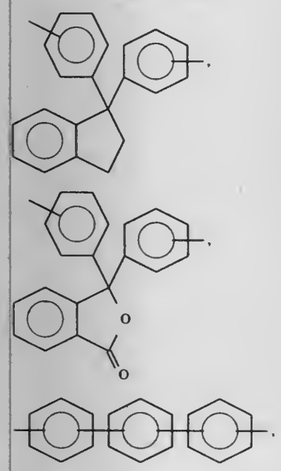
wherein u is an integer of from 1 to about 20,





wherein w is an integer of from 1 to about 20,





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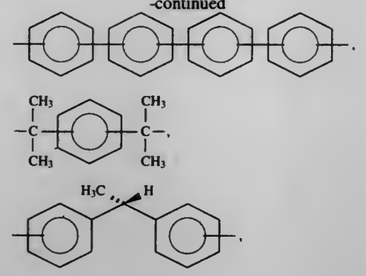
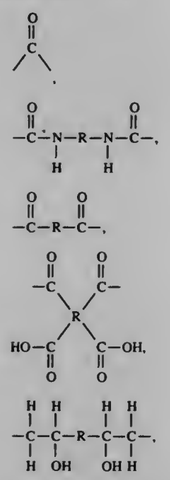
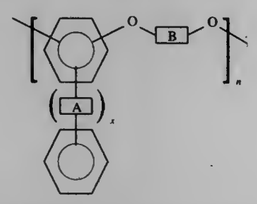


or mixtures thereof, C is



or mixtures thereof, wherein R is an alkyl group, an aryl group, an arylalkyl group, or mixtures thereof, and m and n are integers representing the number of repeating units; (b) those of the formulae



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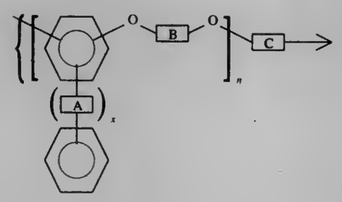

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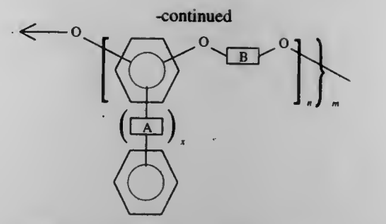

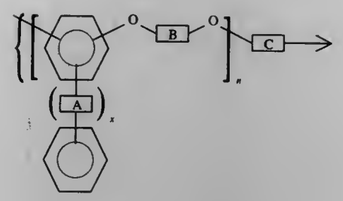

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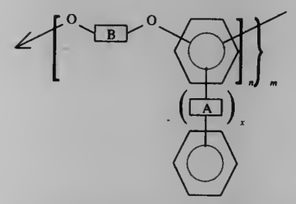
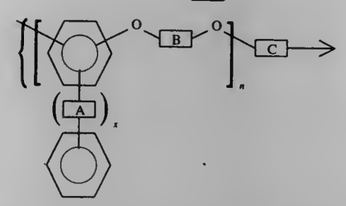
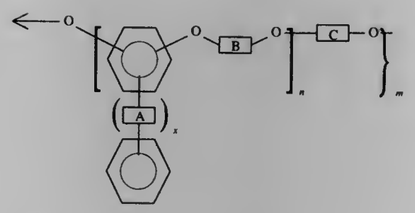




IX



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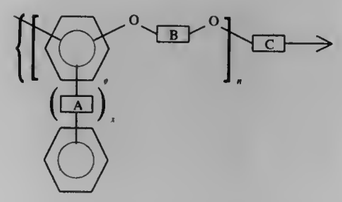

X

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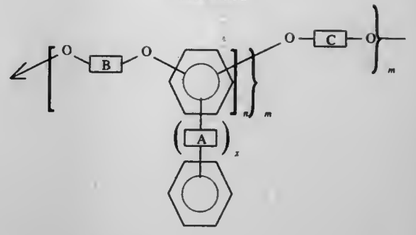
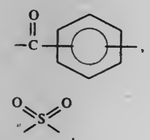
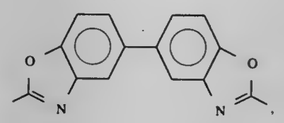
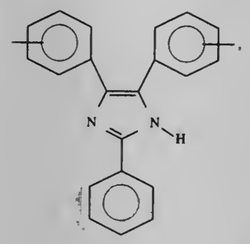
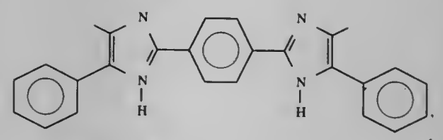


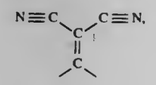
wherein x is an integer of 0 or 1, A is

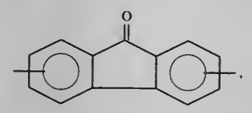












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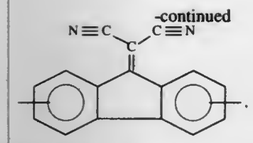
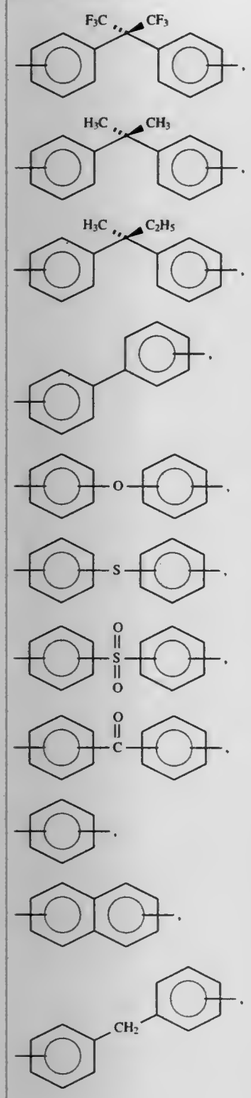


or mixtures thereof, B is



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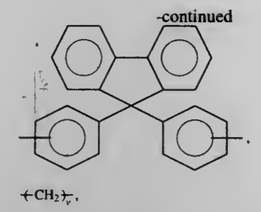
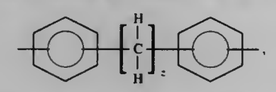


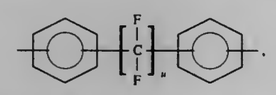
wherein v is an integer of from 1 to about 20,

$-(CH_2O)_t-$

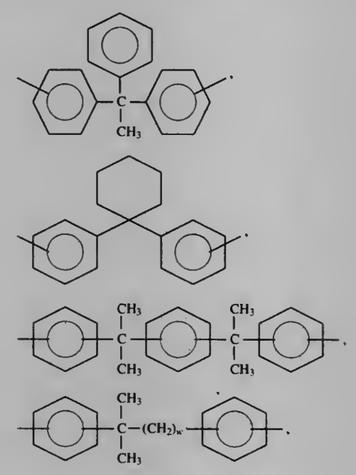
wherein t is an integer of from 1 to about 20,



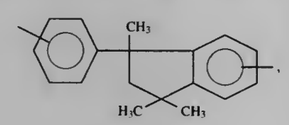
wherein z is an integer of from 2 to about 20,



wherein u is an integer of from 1 to about 20,



wherein w is an integer of from 1 to about 20,



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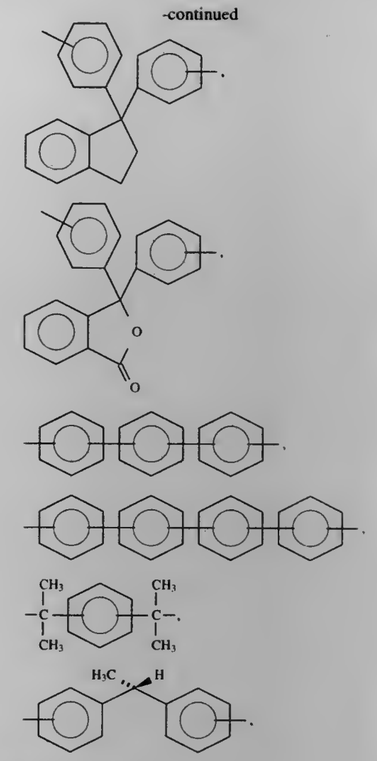
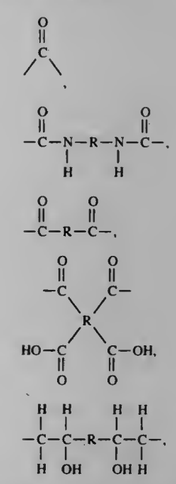
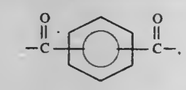


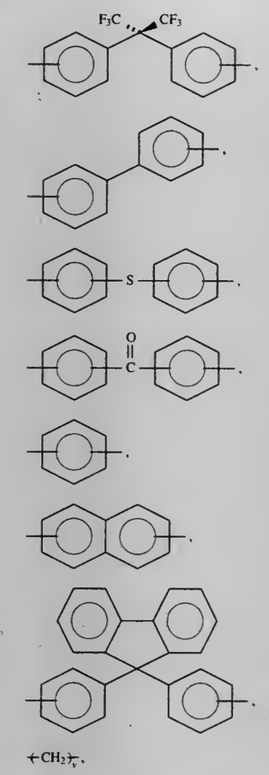
or mixtures thereof, C is



or mixtures thereof, wherein R is an alkyl group, an aryl group, an arylalkyl group, or mixtures thereof, and m and n are integers representing the number of repeating units; (c) those of formulae I, III, IV, VII, or VIII wherein x is an integer of 0 or 1, A is



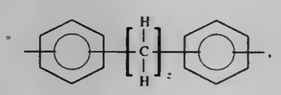
B is



wherein v is an integer of from 1 to about 20,

$-(CH_2O)_t-$

wherein t is an integer of from 1 to about 20,



wherein z is an integer of from 2 to about 20,

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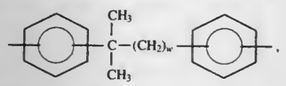
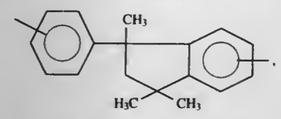
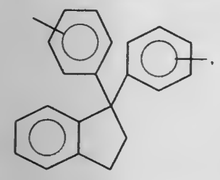
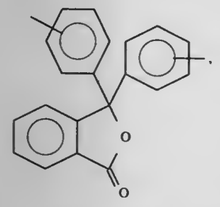
wherein u is an integer of from 1 to about 20,

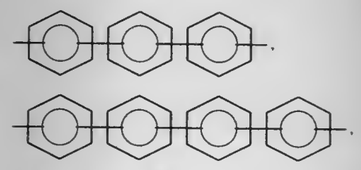


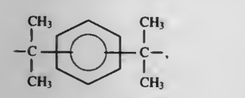
wherein w is an integer of from 1 to about 20,

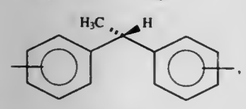




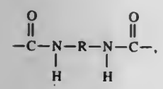


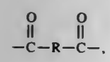






or mixtures thereof, C is





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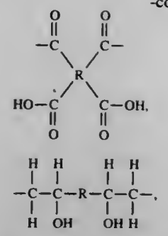

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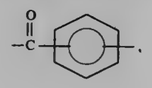
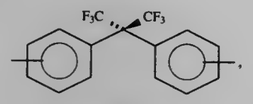
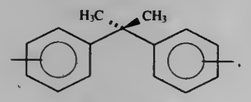
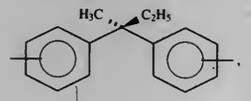
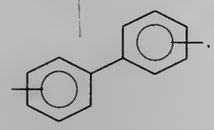


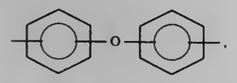
B is

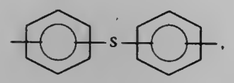


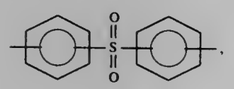


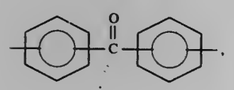












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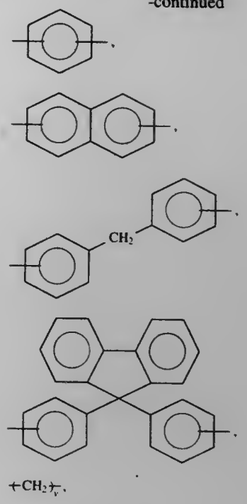
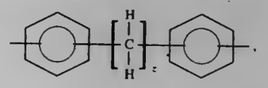


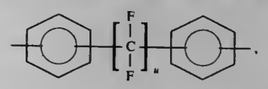
wherein v is an integer of from 1 to about 20,

$-(CH_2O)_t-$

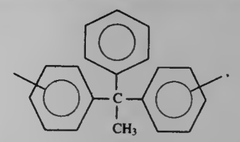
wherein t is an integer of from 1 to about 20,

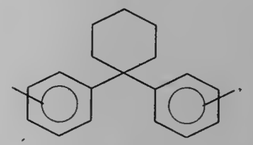


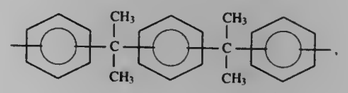
wherein z is an integer of from 2 to about 20,



wherein u is an integer of from 1 to about 20,







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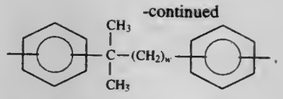
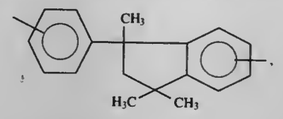
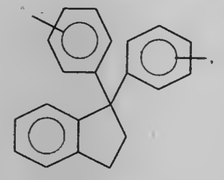
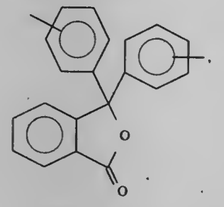
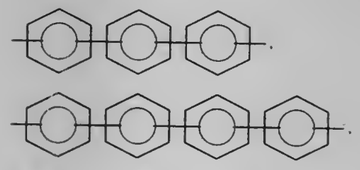


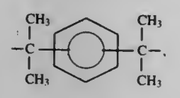
wherein w is an integer of from 1 to about 20,

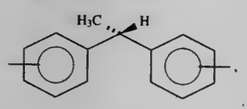




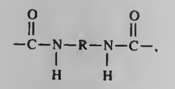


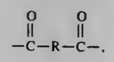






or mixtures thereof, C is





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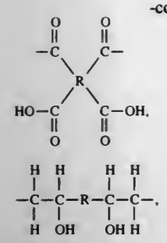
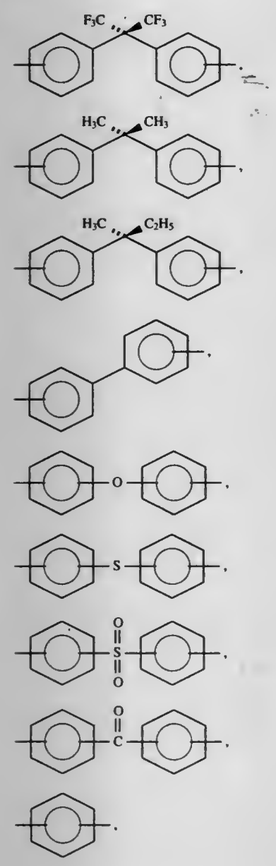


or mixtures thereof, wherein R is an alkyl group, an aryl group, an arylalkyl group, or mixtures thereof, and m and n are integers representing the number of repeating units; or (e) those of formulae I, III, IV, VII, and VIII wherein x is an integer of 0 or 1, A is

B is



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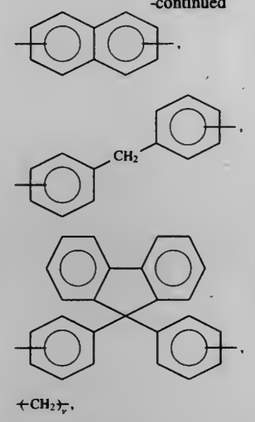
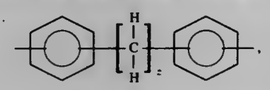


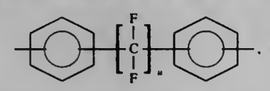
wherein v is an integer of from 1 to about 20,

$-(CH_2O)_t-$

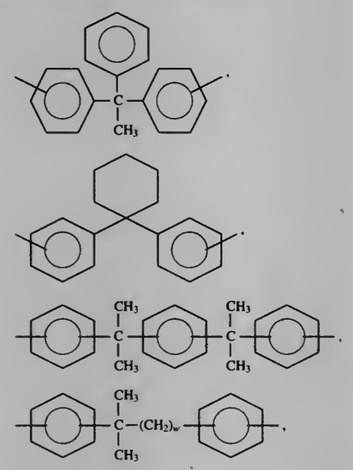
wherein t is an integer of from 1 to about 20,



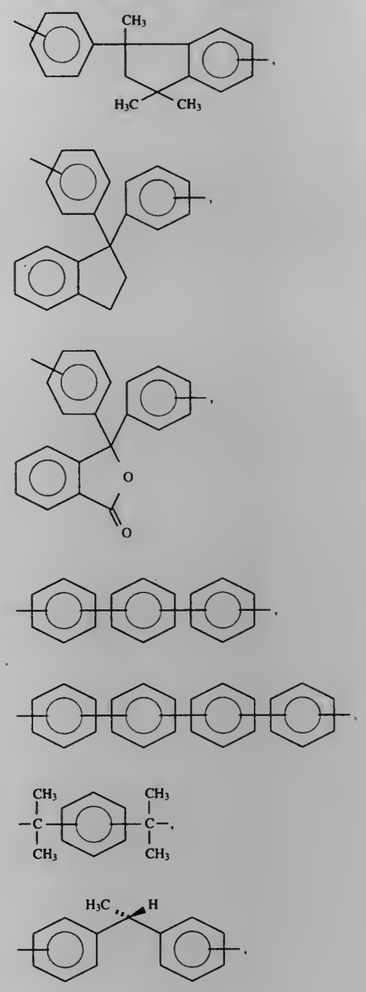
wherein z is an integer of from 2 to about 20,



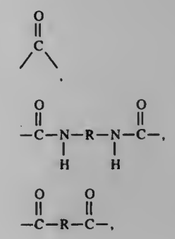
wherein u is an integer of from 1 to about 20,



wherein w is an integer of from 1 to about 20,



or mixtures thereof, C is



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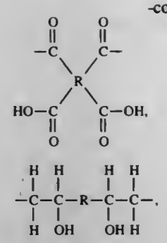

or mixtures thereof, wherein R is an alkyl group, an aryl group, an arylalkyl group, or mixtures thereof, and m and n are integers representing the number of repeating units.

5,814,427

DECOLORIZABLE TONER AND PROCESS FOR PREPARING THE SAME

Katsumi Murofushi; Yoshikazu Hosoda; Akira Yamauchi, all of Kawasaki; Yuki Abe, Kobe; Harushi Nagami, Kobe; Kiyotaka Yamaguchi, Kobe; Takayuki Yoshida, Kobe, and Mitsuhiro Uchino, Kobe, all of Japan, assignors to Bando Chemical Industries, Ltd., Kobe, and Showa Denko K.K., Tokyo, both of Japan

PCT No. PCT/JP94/01837, § 371 Date Jul. 3, 1995, § 102(e) Date Jul. 3, 1995, PCT Pub. No. WO95/12838, PCT Pub. Date May 11, 1995

PCT Filed Oct. 31, 1994, Ser. No. 481,321

Claims priority, application Japan, Nov. 5, 1993, 5-276680; Apr. 4, 1994, 6-066059

Int. Cl.[6] G03G *9/087*

U.S. Cl. 430—109 **9 Claims**

1. A decolorizable toner comprising a visible ray-near infrared ray-absorbing dye, a decolorizing agent and a resin binder, said toner comprising a continuous phase of a resin binder B and a dispersed phase of a resin binder A having an acid value of 8 to 30 mg KOH/g which is incompatible with said resin binder B and is dispersed in said resin binder B, wherein said visible ray-near infrared ray-absorbing dye and said decolorizing agent are incorporated in said resin binder A.

5,814,428

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Kenichi Kido; Tetsuo Sano; Yoshitaka Sekiguchi, all of Amagasaki, and Hiroyuki Fukuda, Kobe, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 9, 1997, Ser. No. 948,415

Claims priority, application Japan, Mar. 4, 1997, 9-049120; Mar. 4, 1997, 9-049121; Mar. 4, 1997, 9-049123

Int. Cl.[6] G03G *9/097*

U.S. Cl. 430—110 **16 Claims**

1. A toner for developing electrostatic latent images comprising:

a binder resin, a colorant, a polyethylene wax and a polypropylene wax;

said binder resin including a polyester resin and having an acid value of 5 to 50 KOHmg/g, said polyethylene wax having a melt viscosity of 1,000 to 8,000 cps at 160° C. and a softening point of 130° to 150° C., and said polypropylene wax having a melt viscosity of 50 to 300 cps at 160° C., a softening point of 130° to 160° C. and an acid value of 1 to 20 KoHmg/g.

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5,814,429

HEAT FIXING METHOD EMPLOYING PEELABLE FILM BETWEEN HEATER AND RECORDING MEDIUM

Hiroaki Kawakami; Yusuke Karami, both of Yokohama; Shinji Doi, Kawasaki; Satoshi Matsunaga, Tokyo; Yasuhide Goseki; Takashige Kasuya, both of Yokohama; Masuo Yamazaki, Kawasaki, and Kiyoko Maeda, Yokosbuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 37,185, Mar. 25, 1993, Pat. No. 5,478,686, which is a continuation of Ser. No. 593,812, Oct. 5, 1990. This application Sep. 14, 1995, Ser. No. 528,532

Claims priority, application Japan, Oct. 5, 1989, 1-258684; Nov. 14, 1989, 1-294036; Dec. 29, 1989, 1-343251

Int. Cl.[6] G03G *13/20*

U.S. Cl. 430—124 **38 Claims**

1. A heat fixing method comprising:

(a) heat-fixing a toner image comprising a toner on a recording medium, to said recording medium employing a heater element stationarily supported and a pressure member opposed to said heater element; said heat-fixing conducted by closely contacting said recording medium and said heater element with a film interposed between said recording medium and said heater element wherein said toner comprises a binder resin and release agent; said binder resin comprising a polyester resin and said release agent comprising a graft-modified polyolefin graft-modified with at least one monomer selected from the group consisting of an aromatic vinyl monomer, an unsaturated aliphatic acid and an unsaturated aliphatic acid ester, said toner has an endothermic peak (T_D) by DSC measurement at a temperature from 40° C. to 120° C.; and

(b) peeling said film from the toner image wherein said film, when peeled from the toner image has surface temperature (T_3) higher than the endothermic peak (T_D) temperature of the toner.

5,814,430

METHOD FOR THE FORMATION OF AN IMPROVED HEAT MODE IMAGE

Eddie Daems, Herentals; Rita Torfs, Herenthout, and Luc Leenders, Herentals, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Aug. 25, 1997, Ser. No. 917,287

Claims priority, application European Pat. Off., Sep. 23, 1996, 96202650

Int. Cl.[6] G03C *8/08;8/40;* **G03F** *7/36*

U.S. Cl. 430—200 **22 Claims**

1. Method for obtaining a heat mode image comprising the following steps:

(A) exposing information-wise to laser radiation a thermal imaging medium comprising the following layers:

(1) a transparent support, optionally subbed,

(2) a layer comprising a reducing agent and a binder,

(3) a barrier layer destructible by heat and preventing the diffusion of said reducing agent to following layer (4) before said laser exposure, and comprising a compound capable of converting laser radiation into heat,

(4) a layer containing a reducible organic metal salt, a binder and optionally a toning agent, said laser exposure inducing destruction of said barrier layer

(3) in the exposed parts and at least partial transfer of said reducing agent of layer (2) into said layer (4), while no destruction and no transfer occur in the unexposed parts, and

(B) optionally subjecting said exposed thermal imaging medium to an overall heat treatment.

5,814,431

PHOTOSENSITIVE COMPOSITION AND LITHOGRAPHIC PRINTING PLATE

Hideki Nagasaka; Akihisa Murata; Toshiyuki Urano, and Ryuichiro Takasaki, all of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jan. 6, 1997, Ser. No. 778,783

Claims priority, application Japan, Jan. 10, 1996, 8-002176; Mar. 12, 1996, 8-054849; Jul. 23, 1996, 8-193587

Int. Cl.[6] G03C *1/725*

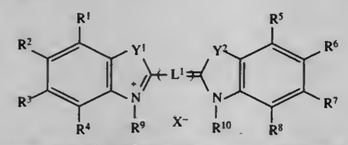
U.S. Cl. 430—281.1 **22 Claims**

1. A photosensitive composition comprising

(a) a resin selected from the group consisting of novolak resins and polyvinylphenol resins;

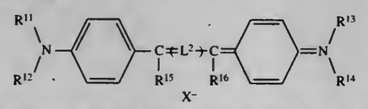
(b) an amino compound derivative capable of curing the resin;

(c) at least one member selected from the group consisting of cyanine compounds of the following formula (I) and polymethine compounds of the following formula (II), as a compound showing absorption in a near infrared wavelength region:



(I)

wherein each of R^1 to R^8 which are independent of one another, is a hydrogen atom, a halogen atom or a nitro group, or the adjacent groups among R^1 to R^8 may be connected to each other to form a condensed benzene ring, each of R^9 and R^{10} which are independent of each other, is an alkyl group which may have a substituent, a phenyl group which may have a substituent, an alkenyl group which may have a substituent, or an alkynyl group which may have a substituent, each of Y^1 and Y^2 which are independent of each other, is a sulfur atom or a dialkylmethylene group, L^1 is a penta- or hepta-methine group which may have a substituent, wherein two substituents on the penta- or hepta-methine group may be connected to each other to form a C_{5-7} cycloalkene ring, and X^- is a counter anion;



(II)

wherein each of R^{11} to R^{14} which are independent of one another, is an alkyl group, each of R^{15} and R^{16} which are independent of each other, is an aryl group which may have a substituent, L^2 is a mono-, tri- or penta-methine group which may have a substituent, and X^- is a counter anion; and

(d) a photosensitive acid-forming agent.

5,814,432

METHOD OF FORMING PATTERNS FOR USE IN MANUFACTURING ELECTRONIC DEVICES

Yoshihito Kobayashi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1995, Ser. No. 551,314

Claims priority, application Japan, Nov. 7, 1994, 6-272276

Int. Cl.[6] G03C *5/00*

U.S. Cl. 430—312 **29 Claims**

1. A method of forming patterns for use in manufacturing electronic devices, comprising the steps of:

forming a radiation sensitive layer on a substrate by coating the substrate with a radiation sensitive composition containing as a first component a compound which generates acid by chemical radiation and as a second component a compound which has at least one bond capable of being decomposed by said acid generated;

irradiating, prior to developing said radiation sensitive layer, an area of said radiation sensitive layer other than a predetermined pattern-formation area of said radiation sensitive layer;

treating a surface of said radiation sensitive layer with a basic compound, thereby inactivating said acid generated in the irradiation area;

irradiating, prior to developing said radiation sensitive layer, said predetermined pattern-formation area of said radiation sensitive layer treated with the basic compound;

applying heat treatment to said substrate; and

developing said radiation sensitive layer.

5,814,433

USE OF MIXTURES OF ETHYL LACTATE AND N-METHYL PYROLLIDONE AS AN EDGE BEAD REMOVER FOR PHOTORESISTS

William C. Nelson, Whitehouse Station, and Octavia Lehar, Flemington, both of N.J., assignors to Clariant Finance (BVI) Limited, Virgin Islands (Br.)

Filed Apr. 3, 1997, Ser. No. 833,170

Int. Cl.[6] G03F *7/38*

U.S. Cl. 430—326 **14 Claims**

1. A process for removing photoresist edge bead and forming an image in the photoresist comprising the steps of:

a) forming a photoresist film on a substrate;

b) applying a photoresist edge bead remover, where the edge bead remover comprises a mixture of N-methyl pyrollidone and ethyl lactate;

c) imagewise exposing the photoresist film;

d) developing the photoresist film; and

e) optionally heating the film before or after the developing step.

5,814,434

COMPOSITION FOR BLACK MATRIX, FABRICATION PROCESS OF BLACK MATRIX AND ARTICLE PROVIDED WITH BLACK MATRIX

Michiel Nakamura; Keiji Nakajima; Shigeru Sakamoto; Takamitsu Shinoda; Mitsuo Yamazaki; Kanako Sato; Motohisa Maruyama; Hiroyoshi Terada; Akira Nishio; Masanori Takakamo, and Toshiaki Anzai, all of Tokyo, Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., and Ukima Colour & Chemicals Mfg. Co., Ltd, both of Tokyo, Japan

Filed Apr. 23, 1996, Ser. No. 636,461

Claims priority, application Japan, Apr. 24, 1995, 120380/95; Jul. 4, 1995, 189743/95; Aug. 25, 1995, 239040/95

Int. Cl.[6] G03C *5/00;* **C09D** *1/00;* **B32B** *9/00*

U.S. Cl. 430—25 **11 Claims**

6. A process for the formation of a black matrix on a substrate, comprising:

forming a black matrix from a composition comprising a black pigment of a compound-oxide of at least two metal oxides, the black pigment having a spinel or inverse-spinel crystalline structure, admixed with an organic binder and a low m.p. glass frit; and

heating said black matrix at a temperature of 450°–900° C. to burn off said organic binder and to fuse said low m.p. glass frit, thereby fixing the compound-oxide black pigment on said substrate.

5,814,435

PHOTOGRAPHIC COMPOSITION HAVING FIXING CAPACITY AND A METHOD FOR PROCESSING USING THE SAME

Tetsuro Kojima; Masaru Yoshikawa, and Yoshihiro Fujita, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 365,113, Dec. 28, 1994, abandoned. This application Aug. 5, 1996, Ser. No. 692,118

Claims priority, application Japan, Dec. 28, 1993, 5-350531

Int. Cl.[6] G03C *7/42*

U.S. Cl. 430—393 **28 Claims**

1. A method for processing a silver halide photographic material, wherein, after a silver halide photographic material having at least one photosensitive silver halide emulsion layer on a support is exposed to light, the silver halide photographic material is subjected to development processing, which comprises processing in a bath having fixing capacity which contains at least one compound represented by the following formula (I):

RSO_2M

wherein R represents a methyl group or an ethyl group, and M represents a hydrogen atom, an alkali metal ion, or an ammonium group, wherein the bath having fixing capacity contains at least one compound represented by formula (I) in an amount of from 1×10^{-3} mol/liter to 5 mol/liter.

5,814,436

METHOD FOR THE PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takatoshi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

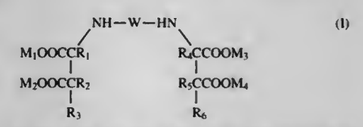
Continuation of Ser. No. 362,931, Dec. 23, 1994, abandoned. This application May 27, 1997, Ser. No. 863,931

Claims priority, application Japan, Dec. 24, 1993, 5-345918

Int. Cl.[6] G03C *7/00;5/44;5/42;1/005*

U.S. Cl. 430—393 **14 Claims**

1. A process for the processing of an exposed silver halide color photographic material comprising at least one silver halide emulsion layer on a support which comprises subjecting the silver halide color photographic material to color development, and then processing the silver halide color photographic material with a processing solution having a bleaching capacity, wherein said emulsion layer comprises tabular silver halide grains having {100} major faces, the tabular silver halide {100} grains having a silver chloride content of 50 to 100 mol % based on the total silver halide amount in said tabular silver halide grains, and said processing solution having a bleaching capacity contains at least one ferric complex salt of a compound represented by the following general formula (I):



(I)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 each represent a hydrogen atom, an aliphatic group, an aromatic group or a hydroxyl group; and W represents a divalent bridging group containing carbon atoms; and M_1, M_2, M_3 and M_4 each represent a hydrogen atom or cation, wherein the compound represented by the general formula (I) comprises an [S,S] form determined about the carbon atom to which R_1 and R_4 are attached in a proportion of not less than 70%.

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5,814,437

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

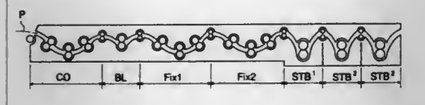
Manabu Nakahanada, and Yutaka Ueda, both of Tokyo, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 644,311, May 10, 1996. This application Oct. 27, 1997, Ser. No. 960,114

Claims priority, application Japan, May 22, 1995, 7-122556

Int. Cl.[6] G03C *7/42*

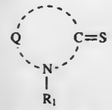
U.S. Cl. 430—393 **10 Claims**



1. A method for processing a silver halide photographic light-sensitive material by an automatic processor having a processing chamber comprising conveying a silver halide photographic light-sensitive material, imagewise exposed to light and developed with a developer, through a chamber which is filled with a processing solution having a fixing ability,

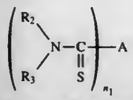
wherein said processing chamber comprises an upper member constituting an upper wall of said chamber, a lower member constituting a bottom wall of said chamber and a conveyor for said light sensitive material, and said upper wall and said bottom wall forming a small volume, and said solution having a fixing ability contains a thiosulfate in an amount of 0.6 moles to 4 moles per liter and a compound represented by the following Formula I, II, III, IV-1, IV-2, IV-3, IV-4, IV-5, or IV-6 and a ratio of said compound to said thiosulfate is 0.05% to 5% by weight:

Formula I



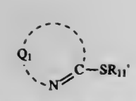
wherein Q is a group of atoms necessary to form a nitrogen-containing heterocyclic ring; and R_1 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group, an aryl group, a heterocyclic group,

Formula II

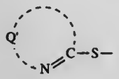


wherein R_2 and R_3 are each a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a hydroxyl group, a carboxyl group, an amino group, an acyl group having 1 to 3 carbon atoms, an aryl group or an alkenyl group; A is —(C=X)—N(R)(R'), —$(CH_2)n_2$—(C=X)—N(R)(R'), —(S)m_1—(C=X)—N(R)(R'), —(S)m_2—$(CH_2)n_3$—(C=X)— N(R)(R'), —(S)m_3—$(CH_2)n_4$—N(R)(R'), —(S)m_4—N(R)(R'), —(NH)n_5— $(CH_2)m_5$—(NH)n_6—(C=X)—N(R)(R'), —S—S—(C=X)—(R)(R'), —SZ or an n_1-valent heterocyclic group; in which R and R' are each synonymous with R_2 and R_3; X is =S, =O or =NR"; Z is a hydrogen atom, an alkali metal atom, an ammonium group, an amino group, a nitrogen-containing heterocyclic residue, an alkyl group such as a methyl group or an ethyl group or —S—B—Y(R_4)(R_5); R" is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group, an aryl group, a heterocyclic residue or an amino group; and n_1 to n_6 and m_1 to m_5 are each an integer of 1 to 6; B is an alkylene group having 1 to 6 carbon atoms, Y is —N<, =C< or —CH<; R_4 and R_5 are each synonymous with R_2 and R_3. R_4 and R_5 each may be —B—SZ; and R_2 and R_3, and R_4 and R_5 each may be bonded together to form a ring;

Formula III

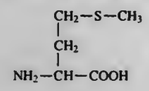


wherein Q_1 is a group of atoms necessary for forming a nitrogen-containing heterocyclic ring; R_{11} is a hydrogen atom, an alkali metal atom,

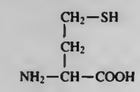


or an alkyl group; Q' is synonymous with Q_1;

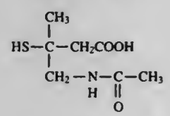
IV-1



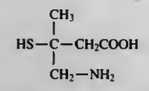
IV-2



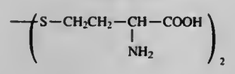
IV-3



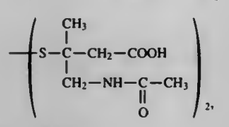
IV-4



IV-5



IV-6



thereby improving fixation.

5,814,438

BENZOTRIAZOLE-BASED NOVEL UV ABSORBERS AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM

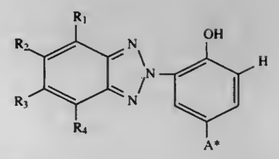
Lal C. Vishwakarma; Glenn M. Brown, both of Rochester, and Barry F. Briffa, Leicester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 624,328, Mar. 29, 1996, abandoned. This application Feb. 13, 1997, Ser. No. 801,599

Int. Cl.[6] G03C *1/815*

U.S. Cl. 430—512 **10 Claims**

1. A photographic element comprising at least one light sensitive silver halide emulsion layer and an ultraviolet absorbing compound of the following structure:



(I)

wherein:

each of R_1–R_4 independently is a hydrogen atom, halogen atom, a carbalkoxy group having at least one asymmetric carbon or asymmetric silicon atom, or an alkoxy group having at least one asymmetric carbon or asymmetric silicon atom, with the proviso that R_2 or R_3, or both R_2 and R_3 are other than hydrogen;

A* is a group having a carbon atom directly attached to 2'-hydroxyphenyl ring at the 5'-position and containing at least one asymmetric carbon atom or asymmetric silicon atom, and;

wherein the ultraviolet absorbing compound of formula (I) is a mixture of two enantiomers about the asymmetric carbon or asymmetric silicon of A*.

5,814,439

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTO-SENSITIVE MATERIAL

Naoto Obshima, and Mitsuo Saitou, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 466,139, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 220,670, Mar. 31, 1994, abandoned. This application Oct. 29, 1996, Ser. No. 739,517

Claims priority, application Japan, Apr. 2, 1993, 5-100418; Oct. 8, 1993, 5-277719

Int. Cl.[6] G03C *1/08;1/34*

U.S. Cl. 430—567 **10 Claims**

1. A silver halide color photographic photo-sensitive material comprising a reflective support having thereon photographic structural layers comprising one or more silver halide emulsion layers, wherein:

the pH of the coating of the silver halide color photographic photo-sensitive material ranges from 4.0 to 6.5, and

at least one of the silver halide color emulsion layers contains at least one mercapto heterocyclic compound and tabular silver halide grains having {100} planes as main planes and having a silver chloride content of 95 mol % or higher, the silver halide grains containing at least one metal complex selected from the group consisting of metal complexes of Fe, Ru, Re, Os, Rh and Ir,

and further wherein, in a silver halide emulsion layer containing the tabular silver halide grains, 35%–100% of a total projection area of all silver halide emulsion grains is occupied by tabular silver halide grains having an aspect ratio (diameter/thickness) of 1.5 or greater, and the tabular silver halide grains are produced by (i) forming seeds having {100} planes, (ii) ripening the seeds and (iii) growing crystals into tabular forms from the seeds, where the tabular grains so produced have at least one gap phase discontinuous in halogen composition at a central portion thereof, said gap being a difference of 10 to 100 mol % in Cl^- content or Br^- content, wherein the gap phase discontinuous in halogen composition is formed by covering a surface of an AgX_1 nucleus with at least an AgX_2 layer wherein AgX_1 represents a silver halide, and AgX_2 represents AgBr, AgCl, or AgClBr, and X_1 is different from X_2 in Cl^- content or Br^- content by from 10 to 100 mol %, whereby a defect in the gap phase-containing central portion causes anisotropic growth of the grain.

5,814,440

METHODS OF OBTAINING COMPOSITIONS ENRICHED FOR HEMATOPOIETIC STEM CELLS, ANTIBODIES FOR USE THEREIN, COMPOSITIONS DERIVED THEREFROM AND METHODS OF USE THEREOF

Beth Louis Hill; Elen Rozler, both of Mountain View, and Benjamin P. Chen, Fremont, all of Calif., assignors to Systemix, Inc., Palo Alto, Calif.

Continuation of Ser. No. 474,792, Jun. 7, 1995, abandoned. This application Feb. 27, 1997, Ser. No. 806,380

Int. Cl.[6] A01N *1/02;* **C12N** *5/08;* **C07K** *16/28;16/44*

U.S. Cl. 435—2 **6 Claims**

1. A method of obtaining a composition of purified hematopoietic stem cells comprising the steps of:

combining a mixture of hematopoietic cells with an antibody that recognizes and binds to EM10 under conditions which allow the antibody to specifically bind to EM10; and

isolating cells recognized by the antibody to obtain a population of cells substantially enriched in $EM10^+$ cells,

wherein EM10 is the antigen bound by antibody SM27-1045 produced by hybridoma ATCC HB11917.

5,814,441

HTLV-I AND HTLV-II PEPTIDE ANTIGENS AND METHODS

Gregory R. Reyes, Palo Alto, and Kenneth G. Hadlock, Hayward, both of Calif., assignors to Genelabs Technologies, Inc., Redwood City, Calif.

Division of Ser. No. 653,091, Feb. 8, 1991, Pat. No. 5,614,366, which is a continuation-in-part of Ser. No. 366,313, Jun. 13, 1989, Pat. No. 5,066,579, which is a continuation of Ser. No. 948,270, Dec. 31, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 481,598

Int. Cl.[6] C12Q *1/70;* **G01N** *23/53;33/567;33/564*

U.S. Cl. 435—5 **4 Claims**

1. A kit for detecting, and distinguishing between infection with HTLV-I and HTLV-II, comprising a solid support with a first immobilized peptide antigen consisting of less than about 77 amino acids derived from HTLV-I envelope gp46 and containing a peptide region consisting of the amino acid sequence presented as SEQ ID NO: 4 which is immunoreactive with anti-HTLV-I monoclonal antibody derived from ATCC HB10571, and a second peptide antigen consisting of about 50 amino acids derived from HTLV-II envelope protein gp46 and containing a peptide region consisting of the amino acid sequence presented as SEQ ID NO: 7, said second peptide antigen immobilized at one or more positions on the solid support spaced apart from the position of the HTLV-I-derived gp46 peptide antigen, said support constructed to permit serum antibodies to contact the immobilized peptide antigens, when such serum is applied to the solid support, and

reagent for detecting the presence of human antibodies bound to said support.

5,814,442

INTERNALLY CONTROLLED VIRION NUCLEIC ACID AMPLIFICATION REACTION FOR QUANTITATION OF VIRION AND VIRION NUCLEIC ACID

Venkatachala Natarajan, Germantown, and Norman P. Salzman, Potomac, both of Md., assignors to Georgetown University, Washington, D.C.

Filed Jun. 10, 1994, Ser. No. 258,288

Int. Cl.[6] C12Q *1/70;1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—5 **23 Claims**

1. A method for quantitating an amount of a wild type virus present in a sample derived from a mammal, amphibian, reptile or bird, said method comprising the steps of:

(a) adding to an aliquot of said sample, as an internal control, a composition comprising a specified amount of a genetically tagged virus containing a genetically tagged nucleic acid

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having a genetic tag sequence, said genetic tag sequence provided by mutating a conserved, non-coding region of a wild type nucleic acid of said wild type virus to contain a deletion, insertion or substitution;

(b) co-isolating said wild type nucleic acid and said genetically tagged nucleic acid, respectively, from said wild type virus and said genetically tagged virus in said sample;

(c) amplifying in vitro said wild type nucleic acid and said genetically tagged nucleic acid from said sample to provide amplified wild type nucleic acid and amplified tagged nucleic acid;

(d) quantitating the ratio of the amount of said amplified wild type nucleic acid to said amplified tagged nucleic acid provided in said amplifying step (c) and

(e) repeating steps (a)–(d) with a different dilution of said specified amount of said genetically tagged virus, wherein the ratio of amplified wild type nucleic acid to genetically tagged nucleic acid, quantitated in step (d), is proportional to the ratio of said wild type virus to said genetically tagged virus in said sample,

wherein said genetically tagged nucleic acid comprises a genetic tag sequence of sufficient length that said wild type and genetically tagged nucleic acids can be quantitated after amplification, and wherein the genetic tag sequence does not interfere with the growth of said genetically tagged virus.

5,814,443

Patent Not Issued For This Number

5,814,444

METHODS FOR MAKING AND USING SINGLE-CHROMOSOME AMPLFICATION LIBRARIES

Peter S. Rabinovitch, Seattle, Wash., assignor to University of Washington, Seattle, Wash.

Filed Jun. 7, 1995, Ser. No. 486,647

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **15 Claims**

1. A method of producing a single-chromosome amplification library corresponding to a target chromosome or subchromosomal fragment, the method comprising the steps of:

(a) providing a population of chromosomes or subchromosomal fragments from a chromosome source comprising a target chromosome or subchromosomal fragment;

(b) flow sorting the population, thereby providing a single isolated chromosome or subchromosomal fragment at each of a plurality of locations;

(c) producing a set of fragments of each of the single isolated chromosomes or subchromosomal fragments;

(d) performing an amplification reaction on each set of fragments, thereby producing a plurality of libraries, each library comprising an amplification product corresponding to a respective set of fragments; and

(e) screening the plurality of libraries to identify a library that is specific for the target chromosome or subchromosomal fragment.

5,814,445

METHOD OF IDENTIFICATION AND CLONING DIFFERENTIALLY EXPRESSED MESSENGER RNAS

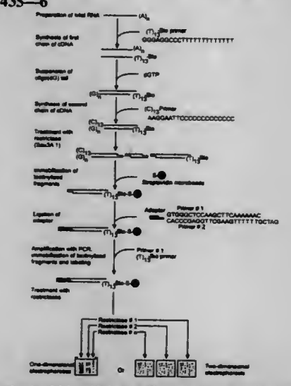
Alexander V. Belyavsky, and Natalia B. Ivanova, both of Moscow, Russian Federation, assignors to New York Blood Center, New York, N.Y.

Filed Jul. 11, 1995, Ser. No. 499,899

Claims priority, application Russian Federation, Jul. 11, 1994, 94024056

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **41 Claims**



1. A method of identifying differential expression of messenger RNA (mRNA) among two or more different sources, comprising:

(a) obtaining mRNA samples from two or more sources;

(b) synthesizing a set of double stranded complementary DNA (cDNA) from each of the mRNA samples;

(c) generating a set of cDNA fragments for each sample by cleaving the sets of cDNA with at least one restriction endonuclease;

(d) separating cDNA fragments obtained through step (c) by gel electrophoresis;

(e) obtaining pictures of the separated cDNA fragments;

(f) comparing pictures of separated cDNA fragments; and

(g) identifying specific cDNA fragments exhibiting different signal intensities in the pictures of separated cDNA fragments, wherein differential signal intensity of the cDNA fragments is indicative of differential expression of mRNA species among the sources.

5,814,446

Patent Not Issued For This Number

5,814,447

METHOD OF DETECTING SPECIFIC NUCLEIC ACID SEQUENCES

Takahiko Ishiguro, Kanagawa-ken; Masami Otsuka; Teruhiko Inoue, both of Kyoto; Hideo Yawata, Kanagawa-ken, and Yukio Sugiura, Kyoto, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Nov. 29, 1995, Ser. No. 564,650

Claims priority, application Japan, Dec. 1, 1994, 6-298665; Jul. 21, 1995, 7-185599

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **8 Claims**

1. In a method of assaying a target nucleic acid, or a nucleic acid in a sample of interest that has at least one specific nucleic acid sequence, said method using as a probe a single-stranded oligonucleotide having a nucleic acid sequence complementary to said specific nucleic acid sequence in the target nucleic acid and including the step of adding the probe to the sample such as to form a complementary bond with the target nucleic acid, the improvement wherein said probe is a single-stranded oligonucleotide labeled with an intercalating fluorochrome which is to be intercalated into the complementary binding portion between the target nucleic acid and the single-stranded oligonucleotide probe, wherein said probe and said target nucleic acid are not bound to a solid support.

5,814,448

POLYMERASE CHAIN REACTION/RESTRICTION FRAGMENT POLYMORPHISM METHOD FOR THE DETECTION AND TYPING OF HUMAN PAPILLOMAVIRUSES

Saul J. Silverstein, Irvington; Octavian Lungu, New York, and Thomas C. Wright, Jr., Irvington, all of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 255,561, Jun. 8, 1994, Pat. No. 5,543,294, which is a continuation of Ser. No. 916,940, Jul. 20, 1992, which is a continuation-in-part of Ser. No. 733,109, Jul. 19, 1991, abandoned. This application Jan. 31, 1996, Ser. No. 594,600

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **11 Claims**

1. A method of typing a human papillomavirus in a patient infected by human papillomavirus which comprises:

a. obtaining a sample containing DNA from the human papillomavirus to be typed;

b. amplifying the L1 portion of the human papillomavirus DNA;

c. treating the resulting amplified DNA with a plurality of predetermined restriction enzymes so as to produce restriction fragments; and

d. analyzing the fragments so produced so as to type the human papillomavirus.

5,814,449

HOMOGENOUS AFFINITY ASSAY FOR QUANTITATIVE DRUG AND METABOLITE DETERMINATION

Jerome S. Schultz, and Ralph Ballerstadt, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed May 28, 1996, Ser. No. 653,844

Int. Cl.[6] G01N *33/53;33/543*

U.S. Cl. 435—6 **17 Claims**

1. A homogenous affinity assay method for the detection and measurement of an analyte of interest comprising:

A. Providing:

i. an unmodified polyvalent receptor-bearing molecule having a receptor with at least two binding sites that have an affinity for the analyte of interest;

ii. a first group of molecules grafted with an analog to the analyte of interest labeled with a first label molecule which generates a measurable response when in close proximity to a second label molecule wherein said first label molecule is attached to at least one site on each member of said first group of molecules; and

iii. a second group of molecules grafted with said analog and labeled with said second label molecule, which said second label molecule is attached to at least one site on each member of said second group of molecules;

B. Exposing a sample suspected of containing the analyte of interest to said unmodified receptor and said first and second groups of molecules, wherein in the absence of the analyte of interest, members of said first group of molecules and members of said second group of molecules are brought in close proximity through affinity binding of said members of said first and second groups of molecules to said receptors which results in the formation of a binding complex, said binding complex consisting of said members of said first and second groups of molecules and said receptors, and which results in said response between said first label and said second label, said response being a change in the physicochemical properties of said first label molecule when it is in close proximity to said second label molecule;

wherein in the presence of the analyte of interest, said binding complexes dissociate or do not form due to competitive replacement or interaction of said analog with the analyte of interest and affinity binding of the analyte of interest to at least one said binding site on said receptors;

wherein said dissociation or said failure to form said binding complexes is in proportion to the concentration of the analyte of interest;

wherein said dissociation or said failure to form said binding complexes affects the magnitude of said response; and

wherein said response is conducted in the presence of a sensor which detects and measures said response, and which sensor detects and measures said response between said members of said first and second groups of molecules;

C. Detecting and measuring said response with a sensor to determine the presence and amount of the analyte of interest.

5,814,450

USE OF MULTIVALENT INORGANIC CATIONS IN THE ELECTROCHEMICAL TREATMENT OF NUCLEIC ACID

Christopher J. Stanley, St. Ives, and Patricia L. Archer, Cambridge, both of England, assignors to Scientific Generics Ltd., Cambridge, England

Division of Ser. No. 256,784, Nov. 18, 1994, Pat. No. 5,607,832. This application Dec. 5, 1996, Ser. No. 759,646

Claims priority, application United Kingdom, Jan. 23, 1992, 9201481

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **20 Claims**

1. A process for amplifying a target sequence of nucleic acid comprising hybridisation, replication and denaturation of nucleic acid, wherein said hybridisation and said denaturation are produced by applying a voltage to a solution containing said nucleic acid with an electrode and wherein the solution contains an effective concentration of a multivalent inorganic cation acting as a promoter which assists said denaturation.

5,814,451

SUBUNITS OF NADH DEHYDROGENASE

Olga Bandman, Mountain View; Surya K. Goli, Sunnyvale, and Jennifer L. Hillman, San Jose, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jan. 17, 1997, Ser. No. 785,065

Int. Cl.[6] C12Q *1/68;* **C12N** *9/06*

U.S. Cl. 435—6 **10 Claims**

1. An isolated and purified polynucleotide sequence encoding a NADH dehydrogenase subunit of SEQ ID NO:1.

5,814,452

HUMAN PROSTATIC CELL LINES IMMORTALIZED BY ADENOVIRUS 12-SIMIAN VIRUS 40 (AD12/SV40) HYBRID VIRUS

Mukta M. Webber, Eagle, Mich., and Johng S. Rhim, Potomac, Md., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich., and The United State of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 234,981, Apr. 28, 1994, Pat. No. 5,610,043. This application Feb. 25, 1997, Ser. No. 806,551

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **8 Claims**

1. A method for testing antineoplastic activity of an agent comprising culturing an immortalized adult human normal pros-

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tatic epithelial or fibroblast cell derived cell line free of other cell lines and containing DNA of adenovirus and simian virus 40 as a hybrid virus, the cell line having the identifying characteristics of the prostatic epithelial or fibroblast cell without the hybrid virus in addition to being immortalized by the hybrid virus with a potential antineoplastic agent and determining growth of said cell line, a lack of growth of said cell line being indicative of antineoplastic potency of said agent.

5,814,453

DETECTION OF FUNGAL PATHOGENS USING THE POLYMERASE CHAIN REACTION

James Joseph Beck, Cary, N.C., assignor to Novartis Finance Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 722,187, Oct. 15, 1996. This application Jul. 2, 1997, Ser. No. 887,480

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **21 Claims**

1. A DNA molecule isolated from the ribosomal RNA gene region of a fungal pathogen, wherein said DNA molecule is selected from the group consisting of: ITS1 of *Fusarium culmorum*, ITS2 of *Fusarium culmorum*, ITS1 of *Fusarium graminearum*, ITS2 of *Fusarium graminearum*, ITS1 of *Fusarium moniliforme*, ITS2 of *Fusarium moniliforme*, ITS1 of *Septoria avenae*, ITS2 of *Septoria avenae*, ITS1 of *Microdochium nivale*, and ITS2 of *Microdochium nivale*.

5,814,454

SETS OF LABELED ENERGY TRANSFER FLUORESCENT PRIMERS AND THEIR USE IN MULTI COMPONENT ANALYSIS

Jingyue Ju, Redwood City, Calif., assignor to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of Ser. No. 784,162, Jan. 15, 1997. This application Nov. 12, 1997, Ser. No. 968,327

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **10 Claims**

1. A method of sequencing a DNA molecule, said method comprising:

enzymatically producing four sets of primer extension products using said DNA molecule as a template, wherein each of said sets comprises a family of different sized primer extension products terminating at the same base, and further wherein each of said sets comprises the same fluorescent label, wherein the fluorescent labels from at least two of said sets comprise the same donor and acceptor fluorophores in energy transfer relationship separated by different distances and capable of providing distinguishable fluorescence emission patterns, wherein all of the labels of said set are acceptor fluorophores selected from the group consisting of TAM, JOE, FAM, ROX, BODIPY, fluorescein and cyanine dyes;

size separating said primer extension products;

detecting said size separated primer extension products; and

determining the sequence of said DNA molecule from said detected size separated primer extension products.

5,814,455

ANTIGEN PREPARATION FOR DETECTING *H. PYLORI*

Allan David Pronovost, San Diego; Jan Waclaw Pawlak, Cardiff, and Kristy S. Condon, San Diego, all of Calif., assignors to Quidel Corporation, San Diego, Calif.

Continuation of Ser. No. 22,817, Feb. 24, 1993, abandoned, which is a continuation of Ser. No. 621,845, Dec. 4, 1990, abandoned. This application Aug. 18, 1994, Ser. No. 292,932

Int. Cl.[6] G01N *33/53;33/536;33/569;* **C12N** *1/00*

U.S. Cl. 435—7.1 **2 Claims**

1. A composition comprising *Helicobacter pylori*-derived proteins useful to detect the presence of *H. pylori* antibodies

wherein said *H. pylori*-derived proteins are obtainable by extracting intact *H. pylori* cells with n-octyl-β-D-glycopyranoside (BOG) to obtain an extract; subjecting said extract to sizing column chromatography to obtain fractions; and recovering urease-depleted fractions having a molecular weight of less than about 200 kD as determined by said sizing column chromatography;

wherein said composition has a urease-specific activity of less than 0.34 OD_{550}/A_{280} in a urease-catalyzed urease hydrolysis assay; and

wherein the *H. pylori*-derived proteins in said composition, when denatured and reduced, are characterized by SDS PAGE to consist of antigens specific to *H. pylori* of molecular weights 120 kD; 66 kD; 62 kD; 59 kD; 52 kD; and 31 kD and common antigens of molecular weights 89 kD; 73 kD; 56 kD; 45 kD; 42 kD; 29 kD; 25 kD; 21 kD; and 16 kD; and

wherein the amounts of antigens of 66 kD and of 56 kD are greater than the amounts of any of the remaining individual antigens set forth above.

5,814,456

SPERM ANTIGEN CORRESPONDING TO A SPERM ZONE BINDING PROTEIN AUTOANTIGENIC EPITOPE

Michael G. O'Rand; Esther E. Widgren; Richard T. Richardson, and Isabel A. Lea, all of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Division of Ser. No. 166,195, Dec. 12, 1993, Pat. No. 5,480,799. This application Jun. 6, 1995, Ser. No. 436,772

Int. Cl.[6] G01N *33/53;33/536;33/535;33/564*

U.S. Cl. 435—7.1 **10 Claims**

1. A method of screening for autoimmune infertility in a subject, comprising:

detecting the presence of antibodies in said subject which bind to a protein or peptide encoded by DNA, said DNA selected from the group consisting of:

(a) isolated DNA having SEQ ID NO:1 and which encodes the human Sp 17 protein having SEQ ID NO:2;

(b) isolated DNA which hybridizes to isolated DNA of (a) above under conditions represented by a wash stringency of 0.3M NaCl, 0.03M sodium citrate, and 0.1% SDS at 60° C., and which encodes a human Sp 17 protein; and

(c) isolated DNA differing from the isolated DNAs of (a) and (b) above in nucleotide sequence due to the degeneracy of the genetic code, and which encodes a human Sp 17 protein,

wherein an elevated level of said antibodies in said subject, compared to a control, indicates autoimmune infertility.

5,814,457

DPC4 POLYPEPTIDE

Scott E. Kern, Hunt Valley, Md., and Stephan A. Hahn, Wilten, Germany, assignors to The Johns Hopkins University School of Medicine, Baltimore, Md.

Division of Ser. No. 588,821, Jan. 19, 1996. This application Aug. 20, 1997, Ser. No. 915,214

Int. Cl.[6] G01N *33/53;33/574;* **C07K** *14/47;16/18*

U.S. Cl. 435—7.1 **6 Claims**

2. A method for detecting the presence of DPC4 polypeptide in a biological sample, comprising:

a) contacting an antibody which binds to DPC4 polypeptide with the biological sample;

b) detecting the presence of an immune complex formed by the binding of the antibody with the DPC4 polypeptide in the sample, wherein the presence of the complex is indicative of the presence of DPC4 polypeptide acid in the sample.

5,814,458

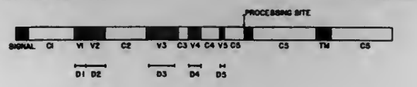
IMMUNOASSAY METHODS FOR THE DETECTION OF HIV-1 ANTIBODIES EMPLOYING ENVELOPE MUTEINS CONTAINING HYPERVARIABLE DOMAIN DELETIONS

Nancy L. Haigwood, Oakland, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 6,252, Jan. 19, 1993, abandoned, which is a continuation of Ser. No. 243,944, Sep. 13, 1988, abandoned. This application Jan. 12, 1995, Ser. No. 371,618

Int. Cl.[6] G01N *33/53;* **C12Q** *1/70;* **A61K** *39/21*

U.S. Cl. 435—7.1 **17 Claims**



HIV–SF2env
2585bp

1. An immunoassay method of detecting antibodies to human deficiency virus type 1 (HIV-1), comprising:

(a) providing a liquid sample to be tested for the presence of anti-HIV-1 antibodies;

(b) contacting said sample with a human immunodeficiency virus type 1 (HIV-1) envelope mutein having the structure C_1-V_1-V_2-C_2-V_3-C_3-V_4-C_4-V_5-C_5 wherein said mutein retains the conserved domains C_1–C_5 and has a deletion of at least one of the hypervariable domains V_1–V_5; and

(c) detecting antibody bound specifically to said polypeptide.

5,814,459

PHOSPHOSPECIFIC TRANSCRIPTION FACTOR ANTIBODIES

Marc R. Montminy, Encinitas, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation of Ser. No. 16,839, Feb. 12, 1993, abandoned. This application May 15, 1995, Ser. No. 442,181

Int. Cl.[6] G01N *33/53;33/536;* **C07K** *16/18;7/04*

U.S. Cl. 435—7.1 **14 Claims**

1. An antibody which binds to phosphorylated CREB polypeptide fragment consisting of the amino acid sequence set forth in SEQUENCE ID NO. 1, wherein the polypeptide fragment is phosphorylated at serine at position 6, but does not bind to ATF-1, CREM, or non-phosphorylated CREB.

4. A method for detecting phosphorylated CREB transcription factor, comprising contacting an antibody according to claim 1 with a permeabilized cell sample or cell lysate suspected of containing phosphorylated transcription factor and measuring the reactivity of antibody and transcription factor.

5,814,460

METHOD FOR GENERATING AND SCREENING USEFUL PEPTIDES

Duane L. Venton, Lombard; Anton J. Hopfinger, Lake Forest, and Guy Lebreton, Oak Park, all of Ill., assignors to Diatide, Inc., Londonderry, N.H.

Continuation-in-part of Ser. No. 932,200, Aug. 21, 1992, Pat. No. 5,366,862, which is a continuation-in-part of Ser. No. 813,315, Aug. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 480,865, Feb. 14, 1990, abandoned. This application Feb. 21, 1995, Ser. No. 387,749

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **24 Claims**

1. A method of identifying peptides which bind specifically to a predetermined target, comprising the steps of:

(a) subjecting a mixture initially comprising a starting protein and/or plurality of starting peptides to conditions, comprising proteolytic enzyme exposure, under which the starting proteins and/or peptides and derivatives thereof can undergo both random degradation into smaller peptide and free amino acid derivatives, and random recombination of the starting proteins and/or peptides, and/or their derivatives, into new peptides, whereby the component amino acids of the starting mixture are scrambled to generate a diverse population of scrambled peptides of different sequences, said scrambled peptides not being characterized by a predetermined amino acid sequence;

(b) allowing the starting peptides, if any, peptide fragments of the starting peptides and/or proteins, and scrambled peptides, to compete with each ocher to bind to the target to form a specifically bound peptide-target complex;

(c) protecting only those competing peptides which are bound to the target from further scrambling;

(d) recovering the specifically bound peptide from a peptide-target complex;

(e) sequencing a recovered specifically bound peptide, wherein the improvement comprises monitoring the formation of peptide-target complex, said monitoring effected directly or indirectly, intermittently or continuously, during the scrambling reaction, by a monitoring method comprising incubating the target with a labeled ligand specific for the target, which ligand is disclaceable by one or more scrambled peptides, and measuring the concentration of free-labeled ligand, target-bound ligand, or unlabeled reagent.

5,814,461

METHOD FOR THE DETERMINATION OF ANTI-TSH RECEPTOR AUTOANTIBODIES

Andreas Bergmann; Joachim Struck, and Shaul Kornfeld, all of Berlin, Germany, assignors to B.R.A.H.M.S. Diagnostica GmbH, Berlin, Germany

PCT No. PCT/EP94/02748, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/06258, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 18, 1994, Ser. No. 596,172

Claims priority, application Germany, Aug. 20, 1993, 43 28 070.6

Int. Cl.[6] G01N *33/53;33/536;33/543;33/566*

U.S. Cl. 435—7.1 **7 Claims**

1. A method for detecting anti-TSH receptor autoantibody in a fluid sample, which method comprises:

(A) contacting a solid phase, said solid phase having bound to it a first monoclonal anti-TSH antibody, with a solution which comprises said sample and which further comprises:

(1) a TSH receptor preparation,

(2) a TSH preparation, under conditions such that

Anti-TSH receptor autoantibody in said sample, if any, binds to TSH receptor in said TSH receptor preparation, thereby reducing the extent of binding of TSH to said TSH receptor compared to the extent of binding of TSH to said TSH receptor under the same conditions in the absence of anti-TSH receptor autoantibody, and

said first monoclonal anti-TSH antibody specifically binds TSH not bound to said TSH receptor in said TSH receptor preparation,

(B) determining the amount of TSH immobilized by said first monoclonal anti-TSH antibody by determining the amount of said TSH bound to said solid phase, and

(C) correlating the amount of TSH immobilized by said first monoclonal anti-TSH antibody, if any, in the presence of said sample with the amount of TSH immobilized by said first monoclonal anti-TSH antibody under the same conditions in the absence of anti-TSH receptor, autoantibody, whereby anti-TSH receptor autoantibody in said sample, if any, is detected.

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5,814,462

BIOCHEMICAL MARKERS OF ISCHEMIA

Judah Weinberger, Teaneck, N.J., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Oct. 2, 1996, Ser. No. 724,794

Int. Cl.[6] G01N *33/53;* **A61K** *35/14*

U.S. Cl. 435—7.1 **34 Claims**

1. A method for identifying the presence of ischemia in a subject with a statistical baseline angiogenic growth factor level which comprises:

(a) obtaining biological samples from the subject at each of a plurality of time intervals within 18 hours of the onset of a symptom including at least one of a chest pain, shortness of breath, and dizziness;

(b) measuring the amount of an angiogenic growth factor in the biological samples at each of the plurality of time intervals; and

(c) comparing the amounts of the angiogenic growth factor measured in step (b), wherein the presence of amounts of the angiogenic growth factor above the statistical baseline during the time intervals is indicative of the occurrence of ischemia at a time substantially contemporaneous with the onset of said symptom.

5,814,463

SCREENING ASSAYS USING NUCLEIC ACIDS ENCODING RECEPTORS FOR BOMBESIN-LIKE PEPTIDES

Eliot R. Spindel, Lake Oswegor; Srinivasa Nagalla, and Brenda Barry, both of Portland, all of Oreg., assignors to The Medical Research Foundation of Oregon, Beaverton, Oreg.

Division of Ser. No. 279,590, Jul. 22, 1994, Pat. No. 5,656,749. This application Aug. 12, 1997, Ser. No. 910,092

Int. Cl.[6] C12Q *1/00;* **C07K** *14/705;* **C12N** *15/12*

U.S. Cl. 435—7.2 **1 Claim**

1. A method of screening for a compound which interacts with a receptor protein for a bombesin-like peptide, said method comprising:

providing a host cell transfected with the nucleic acid encoding a receptor protein for a bombesin-like peptide, comprising the amino acid sequence as set forth in SEQ ID NO: 2;

culturing the host cell under conditions that would allow expression of the receptor protein on the surface of the host cell;

contacting the compound with the receptor protein; and

detecting an interaction between the compound and said expressed receptor protein.

5,814,464

NUCLEIC ACIDS ENCODING TIE-2 LIGAND-2

Samuel Davis, 332 W. 88th St., Apt. B. 2, New York, N.Y. 10024; Pamela F. Jones, 85 Karen St., Fairfield, Conn. 06430, and George D. Yancopoulos, 1519 Baptist Church Rd., Yorktown Heights, N.Y. 10598

Continuation-in-part of Ser. No. 373,579, Jan. 17, 1995, which is a continuation-in-part of Ser. No. 353,503, Dec. 9, 1994, which is a continuation-in-part of Ser. No. 348,492, Dec. 2, 1994, which is a continuation-in-part of Ser. No. 330,261, Oct. 27, 1994, Pat. No. 5,521,073, which is a continuation-in-part of Ser. No. 319,932, Oct. 7, 1994. This application Apr. 6, 1995, Ser. No. 418,595

Int. Cl.[6] C12N *15/12;* **C07K** *14/435*

U.S. Cl. 435—69.5 **11 Claims**

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding human TIE-2 ligand-2, wherein the nucleotide sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding human TIE-2 ligand-2 as set forth in FIGS. 6A and 6B (SEQ I.D. NO. 5); and

(b) a nucleotide sequence that, as a result of the degeneracy of the genetic code, differs from the nucleotide sequence of (a) and encodes a TIE-2 ligand that binds TIE-2 receptor.

5,814,465

BIOTINATED FIREFLY LUCIFERASE, A GENE FOR BIOTINATED FIREFLY LUCIFERASE, A RECOMBINANT DNA, A PROCESS FOR PRODUCING BIOTINATED LUCIFERASE AND A BIOLUMINESCENT ANALYSIS METHOD

Hiroki Tatsumi; Satoshi Fukuda; Mamoru Kikuchi, and Yasuji Koyama, all of Noda, Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Jun. 5, 1995, Ser. No. 460,934

Claims priority, application Japan, Jul. 27, 1994, 6-193798; Mar. 14, 1995, 7-054625; Apr. 24, 1995, 7-098857

Int. Cl.[6] C12Q *1/66;* **C12N** *9/96;9/02;* **G01N** *33/566*

U.S. Cl. 435—7.5 **10 Claims**

1. A biotinated fusion protein having the amino acid sequence of SEQ ID NO: 6 or 9.

5,814,466

METHOD FOR ASSAYING FOR A SUBSTANCE THAT AFFECTS AN SH2-PHOSPHORAYLATED LIGAND REGULATORY SYSTEM

Anthony Pawson, Toronto, Canada, assignor to Mount Sinai Hospital Corporation, Toronto, Canada

Continuation of Ser. No. 221,699, Mar. 28, 1994, which is a continuation of Ser. No. 861,330, Mar. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 786,057, Oct. 31, 1991, Pat. No. 5,352,660. This application Jun. 6, 1995, Ser. No. 479,078

Int. Cl.[6] C12Q *1/48;* **G01N** *33/53;33/566;33/68*

U.S. Cl. 435—7.8 **5 Claims**

1. A method for assaying a medium for the presence of a substance that affects a Src homology region 2-phosphorylated ligand regulatory system comprising the steps of:

(a) reacting a Src homology region 2, a phosphorylated ligand which is a Src homology region 2 binding site on a cytoplasmic tyrosine phosphorylated protein, and a test substance, wherein the Src homology region 2 and the phosphorylated ligand are selected so that they bind to form a Src homology region 2-phosphorylated ligand complex, and the Src homology region 2 and/or the phosphorylated ligand are present in a known concentration; and

(b) comparing to a control in the absence of the substance to determine the effect of the substance.

5,814,467

APO AI POLYPEPTIDES, DIAGNOSTIC METHODS AND SYSTEMS FOR QUANTIFYING APO AI, AND THERAPEUTIC METHODS

Linda K. Curtiss; Carole L. Banka, both of San Diego; David J. Bonnet, Poway, and Richard S. Smith, Del Mar, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 711,333, Jun. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 534,761, Jun. 7, 1990, abandoned. This application Aug. 19, 1994, Ser. No. 292,870

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.9 **18 Claims**

1. A diagnostic system, in kit form, comprising, in an amount sufficient to perform at least one assay, a monoclonal antibody that immunoreacts with:

(a) Apo AI/HDL,

(b) isolated Apo AI,

(c) Apo AI CNBr2, and

(d) the polypeptide KVQPYLDDFQKKWQEE, (SEQ ID NO 1:12– 27), but do not immunoreact with:

(e) Apo AI CNBr1,

(f) Apo AI CNBr3, and

(g) the polypeptide SKDLEEVKAKVQPYLDDEQKKWQEE (SEQ ID NO 4:1–25),

(h) the polypeptide SKDLEEVKAKVQPYLDDFQ (SEQ ID NO 1:3–21), and

(i) the polypeptide PYLDDFQKKWQEEMELYRQKVEP (SEQ ID NO 1:15–37); and an Apo AI polypeptide comprising no more than 60 amino acid residues and including an amino acid residue sequence represented by the formula (SEQ ID NO 1:12–27):

-KVQPYLDDFQKKWQEE-, wherein said polypeptide is free of homoserine lactone.

5,814,468

METHODS OF ENUMERATING RECEPTOR MOLECULES FOR SPECIFIC BINDING PARTNERS ON FORMED BODIES AND IN SOLUTION

Olavi Siiman, Davie; Alexander Burshteyn, Hialeah; Orlando Concepcion, Miramar, and Meryl Forman, Miami, all of Fla., assignors to Coulter International Corp., Miami, Fla.

Filed Mar. 27, 1996, Ser. No. 624,014

Int. Cl.[6] G01N *33/533;* **C12Q** *1/70*

U.S. Cl. 435—7.21 **45 Claims**

1. A method for enumerating receptors on a formed body contained in a whole blood sample, said receptors being capable of binding to a marker, said method comprising the steps of:

(a) incubating a plurality of titers of said blood sample with predetermined amounts of the marker to produce a plurality of mixtures in which the marker concentration varies from mixture to mixture, over a range of between about 100% saturation and about 10% saturation;

(b) analyzing each mixture with excitation radiation to provide a first set of values, each value of said first set representing the mean channel intensity of the fluorescence or light scatter produced by the marker bound to the irradiated blood cells comprising an associated mixture; and

(c) using said first set of values to compute the average number of receptors per formed body in said sample.

5,814,469

METHOD FOR DIAGNOSING ENDOMETRIAL CANCER

John Stephen Haskill, Chapel Hill, N.C., assignor to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 425,232, Apr. 18, 1995, which is a continuation of Ser. No. 791,474, Nov. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 594,827, Oct. 9, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 484,598

Int. Cl.[6] G01N *33/574;33/53*

U.S. Cl. 435—7.23 **7 Claims**

1. A method for diagnosing endometrial cancer in a human patient comprising measuring the amount of intracellular IL-1 receptor antagonist present in endometrial cells from a human patient suspected of having said cancer, and comparing the amount to that present in normal endometrial cells.

5,814,470

MELITTIN-RELATED POLYPEPTIDES, MIXTURE SETS AND LIBRARIES THEREOF

Sylvie Blondelle, San Diego; Richard A. Houghten, Solana Beach, and Enrique Perez-Paya, San Diego, all of Calif., assignors to Torrey Pines Institute for Molecular Studies, San Diego, Calif.

Division of Ser. No. 295,086, Aug. 24, 1994, Pat. No. 5,645,996. This application Jul. 7, 1997, Ser. No. 888,562

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.32 **9 Claims**

1. A process for determining the sequence of a linear polypeptide that exhibits preferential antimicrobial, hemolytic or catalytic hydrolysis of a predetermined substrate comprising the steps of:

(i) providing a library of a plurality of sets of linear polypeptides in which each set comprises a mixture of equimolar amounts of polypeptide member chains having the sequence

$$Xaa^1Xaa^2Xaa^3GlyIleGlyAlaValLeuXaa^{10}$$
$$ValLeuXaa^{13}Xaa^{14}Xaa^{15}Xaa^{16}Xaa^{17}$$
$$AlaLeuIleSerTrpIleLysArgXaa^{26}Xaa^{27}Xaa^{28}Xaa^{29} \text{ (SEQ ID NO:2)}$$

wherein for each polypeptide

(a) each of Xaa^1, Xaa^2 and Xaa^3 is present or absent, with the provisos that Xaa^2 is present only if Xaa^3 is present, and Xaa^1 is present only if Xaa^2 is present;

(b) Xaa^3 when present is an amino acid residue selected from the group consisting of Asp, Glu, Asn, Gln, Ser, Lys and Arg;

(c) Xaa^2 when present is an amino acid residue selected from the group consisting of Asp, Glu, Asn, Gln, Ser, Lys and Arg;

(d) Xaa^1 when present is an amino acid residue selected from the group consisting of Ala, Val, Leu, Ile, Trp and Phe;

(e) Xaa^{10} is an amino acid residue selected from the group consisting of Lys, Asp and Glu;

(f) Xaa^{26}, Xaa^{27}, Xaa^{28} and Xaa^{29} are present or absent, with the provisos that Xaa^{27} is present only if Xaa^{26} is present, Xaa^{28} is present only if Xaa^{27} is present, and Xaa^{29} is present only if Xaa^{28} is present;

(g) Xaa^{26} when present is Lys, Xaa^{27} when present is Arg, Xaa^{28} when present is Gln and Xaa^{29} when present is Gln—NH_2; and

(h) each of Xaa^{13}, Xaa^{14}, Xaa^{15}, Xaa^{16} and Xaa^{17} is one of at least six different predetermined amino acid residues; and

wherein for each said set

(a') one of Xaa^{13}, Xaa^{14}, Xaa^{15}, Xaa^{16} and Xaa^{17} is the same, predetermined residue, present at the same chain position in each polypeptide; and

(b') at least one other chain position occupied by Xaa^{13}, Xaa^{14}, Xaa^{15}, Xaa^{16} and Xaa^{17} contains an equimolar amount of said at least six different amino acid residues,

each set of said library differing from the other sets in the identity and chain position of said one same predetermined residue present at the same predetermined chain position within each set; and

(ii) separately admixing each set from said library of sets with microbes, red blood cells or catalyst substrate in an aqueous medium at a set concentration of about 0.1 milligrams per liter to about 100 grams per liter, and separately assaying the antimicrobial, hemolytic or catalytic activity, respectively, exhibited by each set,

the residue that exhibited preferential activity at each of positions Xaa^{13-17} providing the sequence of a polypeptide that has preferential antimicrobial, hemolytic or catalytic activity in the assay used.

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5,814,471

LUCIFERASE INHIBITOR COMPOSITIONS AND METHODS OF USING SAME

Keith V. Wood, Madison, Wis., assignor to Promega Corporation, Madison, Wis.

Continuation of Ser. No. 189,558, Jan. 31, 1994, Pat. No. 5,650,289, which is a division of Ser. No. 580,371, Sep. 10, 1990, Pat. No. 5,283,179. This application Apr. 9, 1997, Ser. No. 831,781

Int. Cl.[6] C12Q *1/66;* **G01N** *33/53;* **H01L** *21/306*

U.S. Cl. 435—8 **33 Claims**

12. A method for the detection of luciferase in a sample, comprising the steps of:

(a) mixing a sample containing luciferase with a solution, the solution comprising coenzyme A, luciferin and a luciferase inhibitor; and

(b) measuring the luminescence produced from the sample and solution to detect the luciferase.

5,814,472

MEASUREMENT OF LDL-CHOLESTEROL

Yutaka Miki; Nobuko Imajo; Isao Koyama, and Toshiro Hanada, all of Amagasaki, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 2, 1997, Ser. No. 943,008

Claims priority, application Japan, May 13, 1997, 9-137713; May 13, 1997, 9-137714

Int. Cl.[6] C12Q *1/60;1/32;1/00;1/44*

U.S. Cl. 435—11 **34 Claims**

1. A process for measuring cholesterol in low density lipoproteins present in a living sample by optically measuring a reaction product of the living sample with a reagent, which comprises conducting the reaction of the living sample with cholesterol oxidase or cholesterol dehydrogenase in the presence of an amphoteric surfactant and at least one member selected from the group consisting of cyclodextrin and derivatives thereof.

5,814,473

TRANSAMINASES AND AMINOTRANSFERASES

Patrick V. Warren, Philadelphia, and Ronald V. Swanson, Media, both of Pa., assignors to Diversa Corporation, La Jolla, Calif.

Filed Feb. 9, 1996, Ser. No. 599,171

Int. Cl.[6] C12Q *1/48;1/52;* **C12P** *21/06;* **C12N** *9/10*

U.S. Cl. 435—15 **16 Claims**

1. An isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding an enzyme as set forth in SEQ ID NOS: 25–32;

(b) a polynucleotide which is complementary to the polynucleotide of (a); and

(c) a polynucleotide comprising at least 15 consecutive bases of the polynucleotide of (a) or (b) and which hybridize under stringent conditions to a polynucleotide encoding an enzyme as set forth in SEQ ID NOS: 25–32.

5,814,474

DIRECT IDENTIFICATION OF MICROORGANISMS IN CULTURE BOTTLES

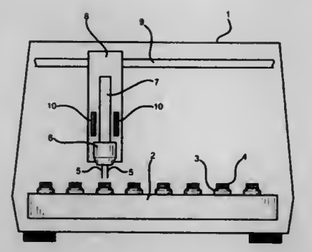
Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 23, 1996, Ser. No. 685,255

Int. Cl.[6] C12Q *1/04*

U.S. Cl. 435—34 **8 Claims**

1. A method for identifying microorganisms directly in a culture bottle without removal of liquid from said culture bottle, the culture bottle having been identified as positive for microorganisms, wherein said culture bottle also contains a specimen, a growth medium and a head space gas, said method comprising:



repetitively extracting head space gas from said culture bottle;

guiding the repetitively extracted head space gas to an array of non-specific gas sensors for repetitively measuring the concentration of compounds in the head space gas over a period of time;

repetitively monitoring the consumption of volatile compounds that have been emitted by the growth media and the production of new volatile compounds that are produced by the microorganisms over the period of time and generating data representative of said monitoring; and

comparing the data generated by repetitively monitoring the consumption of compounds using the array of non-specific gas sensors with previously generated data of known microorganisms so to identify an unknown microorganism in said culture bottle using a computer connected to the sensor array.

5,814,475

HUMAN HERPESVIRUS TYPE 6 PROTEIN P100, THE CORRESPONDING DNA SEQENCES, THEIR PREPARATION AND USE

Frank Neipel, Erlangen, and Bernhard Fleckenstein, Wiesenthau, both of Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Continuation of Ser. No. 126,435, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 908,041, Jul. 6, 1992, abandoned. This application Jun. 27, 1994, Ser. No. 266,311

Claims priority, application European Pat. Off., Jul. 8, 1991, 91111338

Int. Cl.[6] C07H *21/04;* **C12N** *15/09;15/38;* **C12P** *21/00*

U.S. Cl. 435—69.1 **12 Claims**

1. An isolated and purified DNA molecule having a nucleotide sequence encoding a human herpesvirus type 6 (HHV-6) protein p100 having the amino acid sequence given in FIG. 3 (SEQ ID NO:1).

5,814,476

PROCESS FOR THE PRODUCTION OF STOCHASTICALLY-GENERATED TRANSCRIPTION OR TRANSLATION PRODUCTS

Stuart Alan Kauffman, Bryn Mawr, Pa., and Marc Ballivet, Geneva, Switzerland, assignors to Stuart Kauffman, Santa Fe Institute, N. Mex.

Continuation of Ser. No. 349,510, Dec. 2, 1994, Pat. No. 5,723,323, which is a continuation of Ser. No. 133,952, Oct. 8, 1993, abandoned, which is a continuation of Ser. No. 977,307, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 616,319, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 942,630, Nov. 20, 1986, abandoned. This application Jun. 5, 1995, Ser. No. 468,477

Claims priority, application Switzerland, Mar. 30, 1985, 485003

Int. Cl.[6] C12P *21/06;* **C12N** *15/63;15/00;* **C07H** *21/04*

U.S. Cl. 435—69.1 **107 Claims**

1. A process for the production of a transcription product or a translation product, comprising the steps of:

producing a stochastically-generated polynucleotide sequence;

producing a library of expression vectors comprising said stochastic polynucleotide sequence;

transforming or transfecting a competent clone with said library of expression vectors;

amplifying said transformed or transfected competent clone;

screening and/or selecting said transformed or transfected clone in order to isolate a clone expressing a stochastic polynucleotide sequence capable of synthesizing a transcription product or a translation product having a predetermined property; and

isolating said selected or screened transformed clone;

isolating a stochastically generated polynucleotide sequence which encodes the identified transcription product or translation product

using the isolated sequence to produce the transcription product or translation product having the predetermined property.

5,814,477

RECOMBINANT CLOSTRIDIAL TOXIN PROTEIN

James A. Williams; John A. Kink; Christopher M. Clemens, all of Madison, and Sean B. Carroll, Cottage Grove, all of Wis., assignors to Ophidian Pharmaceuticals, Inc., Madison, Wis.

Division of Ser. No. 161,907, Dec. 2, 1993, Pat. No. 5,601,823, which is a continuation-in-part of Ser. No. 985,321, Dec. 4, 1992, which is a continuation-in-part of Ser. No. 429,791, Oct. 31, 1989, Pat. No. 5,196,193. This application Jun. 1, 1995, Ser. No. 457,048

Int. Cl.[6] C12N *15/31;15/00;15/09*

U.S. Cl. 435—69.1 **5 Claims**

1. A method of producing clostridial toxin comprising:

a) providing a host cell overproducing a portion of *Clostridium difficile* toxin A encoded by the restriction fragments produced by restriction of *Clostridium difficile* genomic DNA comprising the *Clostridium difficile* toxin A gene with restriction enzymes SpeI and PstI; and

b) purifying said portion of said toxin.

5,814,478

TYROSINE KINASE RECEPTORS AND LIGANDS

David M. Valenzuela, Franklin Square; David J. Glass, White Plains; David C. Bowen, Yonkers, and George D. Yancopoulos, Yorktown Heights, all of N.Y., assignors to Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Filed May 10, 1996, Ser. No. 644,271

Int. Cl.[6] C12P *21/06*

U.S. Cl. 435—65.1 **21 Claims**

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide having the MuSK-activating activity of human agrin, wherein the nucleotide sequence is selected from the group consisting of:

(a) the nucleotide sequence encoding the polypeptide having the MuSK-activating activity of human agrin contained in the vector designated as pBL-hAgrin 1 (ATCC Accession No. 97378); and

(b) a nucleotide sequence that, as a result of the degeneracy of the genetic code, differs from the nucleotide sequence of (a) and which encodes a polypeptide having the MuSK-activating activity of human agrin.

5,814,479

BSK RECEPTOR-LIKE TYROSINE KINASE

Renping Zhou, 1112 Hanover St., Piscataway, N.J. 08854; Nicholas T. Schulz, 125 Hastings St., Pittsburg, Pa. 15206; Lawrence F. Kromer, 4652 N. 245h St., Arlington, Va. 11207, and George F. Vande Woude, Rte. 1, Box 2905, Berryville, Va. 22611

Continuation of Ser. No. 177,812, Jan. 4, 1994, abandoned. This application Jun. 11, 1996, Ser. No. 673,789

Int. Cl.[6] C12N *15/12;15/52*

U.S. Cl. 435—69.1 **17 Claims**

1. An isolated nucleic acid sequence encoding a protein comprising the amino acid sequence shown in SEQ ID NO:2.

5,814,480

DNA ENCODING HUMAN METALLOTHIOEIN

Jennifer L. Hillman, San Jose, and Surya K. Goli, Sunnyvale, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jan. 17, 1997, Ser. No. 785,530

Int. Cl.[6] C12N *15/00*

U.S. Cl. 435—69.1 **9 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,814,481

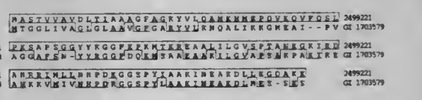
HEAT SHOCK-LIKE PROTEIN

Jennifer L. Hillman, San Jose, and Purvi Shah, Sunnyvale, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Apr. 25, 1997, Ser. No. 846,134

Int. Cl.[6] C12N *15/12;15/63;1/00;5/10;* **C12P** *21/02*

U.S. Cl. 435—69.1 **8 Claims**



1. An isolated and purified polynucleotide sequence which encodes the heat shock-like protein (HSPRO) of SEQ ID NO:1.

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5,814,482

EUKARYOTIC LAYERED VECTOR INITIATION SYSTEMS

Thomas W. Dubensky, Jr., P.O. Box 675205, Rancho Sante Fe, Calif. 92067; John M. Polo, 1222 Reed Ave., Number 4, San Diego, Calif. 92109; Douglas J. Jolly, 277 Hillcrest Dr., Leucadia, Calif. 92024, and David A. Driver, 5142 Biltmore St., San Diego, Calif. 92117

Division of Ser. No. 404,796, Mar. 15, 1995, which is a continuation-in-part of Ser. No. 376,184, Jan. 18, 1995, abandoned, which is a continuation-in-part of Ser. No. 348,472, Nov. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 198,450, Feb. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 122,791, Sep. 15, 1993, abandoned. This application Oct. 30, 1996, Ser. No. 739,158

Int. Cl.[6] C12P *21/00;* **C12N** *15/86;* **C07H** *21/04*

U.S. Cl. 435—69.3 **25 Claims**

1. A method of stimulating in an animal an immune response to an antigen comprising introducing into susceptible target cells a eukaryotic layered vector initiation system comprising a eukaryotic promoter 5' of viral cDNA which initiates within said cell the 5' to 3' synthesis of RNA from said cDNA, wherein said RNA comprises a vector construct which autonomously amplifies in said cell and expresses a heterologous nucleic acid sequence, wherein said heterologous nucleic acid sequence encodes an antigen or modified form thereof which stimulates an immune response within an animal.

5,814,483

EXPRESSION OF HETEROLOGOUS POLYPEPTIDES FROM A MINI MU VECTOR

Robin A. Weinberg; Pamela A. De Clechi, both of St. Louis, and Mark G. Obukowicz, Kirkwood, all of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 906,393, Jun. 21, 1992, Pat. No. 5,395,763. This application May 20, 1994, Ser. No. 246,862

Int. Cl.[6] C12P *21/00;* **C12N** *15/09;1/21;15/16*

U.S. Cl. 435—69.4 **6 Claims**

1. A host bacterium transfected with a Mini-Mu vector, which comprises;

Mu elements required for replicative transposition wherein said elements consist essentially of the Mu A and B transposition genes, the two attachment sites attL and attR, and the genes encoding the regulatory proteins cts62 and ner all of which are in the order shown in FIG. 1; and

a Mu mor gene, a mu middle promoter, a ribosome binding site linked to at least one unique restriction site, and a gene encoding a selectable marker all of which are operably linked and in proper reading frame to a DNA insert comprising codons for a heterologous polypeptide.

5,814,484

EXPRESSION OF MACROPHAGE INDUCIBLE PROTEINS (MIPS) IN YEAST CELLS

Patricia Tekamp-Olson, 80 Camino de Herrera, San Anselmo, Calif. 94960, and Carol Ann Gallegos, 605 Carmel Ave., Albany, Calif. 94706

Continuation of Ser. No. 951,321, Sep. 25, 1992, abandoned, which is a continuation of Ser. No. 582,636, Sep. 14, 1990, abandoned. This application Jan. 31, 1995, Ser. No. 383,691

Int. Cl.[6] C12N *1/19;15/19;15/67;15/81*

U.S. Cl. 435—69.9 **11 Claims**

1. A yeast cell producing a biologically active MIP polypeptide, said yeast cell comprising a DNA molecule comprising in order of transcription:

(a) a transcription regulatory region operative in a yeast; and

(b) a region which comprises a sequence that encodes a mammalian protein selected from the group consisting of MIP-1α and MIP-1β.

5,814,485

PRODUCTION OF INTERFERON-β (IFN-β) IN *E. COLI*

Glenn Dorin, San Rafael; Patrick J. McAlary, San Francisco, and Kathleen M. Wong, Berkeley, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Jun. 6, 1995, Ser. No. 477,310

Int. Cl.[6] C12N *15/22;1/21*

U.S. Cl. 435—69.51 **10 Claims**

1. A method for producing an interferon-β (IFN-β) polypeptide in *Escherichia coli*, comprising:

(a) providing an *Escherichia coli* host cell transformed with a vector comprising a sequence encoding an IFN-β polypeptide; and

(b) culturing the cell under conditions effective to induce production of the IFN-β polypeptide in a medium comprising a concentration of potassium cations no greater than about 75 mM and a concentration of sodium cations no greater than about 40 mM, wherein the pH of the medium is maintained between about 5.4 and about 6.0.

5,814,486

HERPES SIMPLEX VIRUS GLYCOPROTEIN D VARIANTS

Gary H. Cohen, Havertown, Pa.; Roselyn T. Eisenberg, Haddonfield, N.J., and Anthony Nicola, Philadelphia, Pa., assignors to Competitive Technologies, Inc., Westport, Conn.

PCT No. PCT/US96/11344, § 371 Date May 7, 1997, § 102(e) Date May 7, 1997, PCT Pub. No. WO97/03199, PCT Pub. Date Jan. 30, 1997

PCT Filed Jul. 3, 1996, Ser. No. 793,958

Claims priority, application European Pat. Off., Jul. 7, 1995, 08499568

Int. Cl.[6] C12P *21/02;* **C07K** *14/03;* **C12N** *15/38;5/10*

U.S. Cl. 435—69.3 **4 Claims**

1. A method for inhibiting the infection of susceptible cells by herpes simplex virus comprising contacting said cells with a composition comprising a variant herpes simplex virus glycoprotein D molecule comprising amino acids 1 to 300 of SEQ ID NO: 2 and an acceptable carrier.

5,814,487

USE OF AGARASE ENZYME TO ISOLATE NUCLEIC ACIDS

Mark W. Knuth, Waunakee, and Susanne Selman, Madison, both of Wis., assignors to Promega Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 655,704, Jun. 3, 1996. This application Feb. 13, 1997, Ser. No. 799,552

Int. Cl.[6] C12P *19/44;19/14;* **C12N** *9/24;* **C08B** *1/00*

U.S. Cl. 435—74 **21 Claims**

1. A process for isolating nucleic acids from agarose, comprising:

a. adding a chaotropic substance to the agarose in a quantity sufficient to lower the melting temperature of the agarose to a range suitable for isolating and harvesting the nucleic acids; and

b. adding an agarase enzyme to the agarose in a quantity sufficient to isolate the nucleic acids from the agarose.

5,814,488

SEMISYNTHETIC 1-N-ETHYLGENTAMICIN C_{1A} AND METHOD FOR ITS PREPARATION

Min Zhao; Jin Fan; Jun Liu; Xiaoling Hu, and Minqi Fan, all of Wuxi, China, assignors to Jiansgu Institute of Microbiology, Wuxi, China

PCT No. PCT/CN94/00029, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO94/25566, PCT Pub. Date Nov. 10, 1994

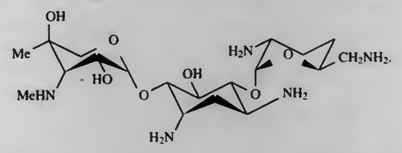
PCT Filed Apr. 23, 1994, Ser. No. 537,784

Claims priority, application China, Apr. 23, 1993, 93 1 12412.3

Int. Cl.[6] C12N *1/20*

U.S. Cl. 435—84 **17 Claims**

1. *Micromonospora echinospora* strain CGMCC0197, which strain produces monocomponent gentamicin C_{1a}, of formula (I)



2. A method of producing semisynthetic 1-N-ethylgentamicin C_{1a}, comprising:

(a) producing monocomponent gentamicin C_{1a} by fermenting *Micromonospora echinospora* mutant CGMCC0197, and recovering gentamicin C_{1a} from the fermentation broth; and

(b) selectively ethylating the 1-amino group of the gentamicin C_{1a}, and recovering the resultant 1-N-ethylgentamicin C_{1a}.

5,814,489

PCR AMPLIFICATION OF MRNA

Kevin J. Scanlon, Pasadena, Calif., assignor to City of Hope, Duarte, Calif.

Continuation of Ser. No. 102,946, Aug. 6, 1993, Pat. No. 5,618,702, which is a continuation-in-part of Ser. No. 234,096, Aug. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 46,127, May 5, 1987, abandoned. This application Aug. 4, 1995, Ser. No. 511,237.

Int. Cl.[6] C12P *19/34*

U.S. Cl. 435—91.2 **6 Claims**

1. A method for producing a substantially contaminating DNA-free PCR amplification product from a cellular DNA-contaminated gene transcript, the method comprising:

(a) providing a transcript of a gene,

said gene having an intron flanked by first and second exons,

said transcript including mRNA and, as a contaminant, template DNA from which said mRNA was transcribed,

said mRNA having a first portion complementary only to a sequence of said first exon and an abutting second portion complementary only to a sequence of said second exon;

(b) providing first and second PCR primers,

said first PCR primer being complementary to said first portion of said mRNA and,

said second PCR primer being complementary to the complement of said abutting second portion of said mRNA;

(c) annealing said primers to said mRNA and thereafter adding reverse transcriptase to provide double stranded DNA, one strand of which has the sequence of said mRNA and the other strand of which is complementary to said sequence of said mRNA;

(d) subjecting said double stranded DNA to polymerase chain reaction amplification utilizing said first and second primers to simultaneously amplify (i) said double stranded DNA and (ii) said DNA contaminant;

wherein said amplified double stranded DNA which has no sequence complementary to said intron is of substantially lower molecular weight than said amplified DNA contaminant which includes said intron;

(e) utilizing the difference in molecular weight to separate said amplified double stranded DNA substantially free of said amplified contaminant; and

(f) denaturing said separated double stranded DNA to produce a substantially contaminating DNA free single stranded PCR amplification product.

5,814,490

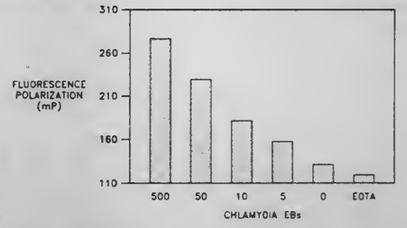
AMPLIFICATION AND DETECTION OF CHLAMYDIA TRACHOMATIS NUCLEIC ACIDS

Patricia A. Spears, Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 11, 1996, Ser. No. 661,507

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04;* **C07M** *21/00*

U.S. Cl. 435—91.2 **23 Claims**



1. pair of amplification primers comprising

a) a first primer consisting of a target binding sequence selected from the group consisting of the target binding sequences of SEQ ID NO:1 and SEQ ID NO:3, and, optionally, a sequence required for an amplification reaction, and;

b) a second primer consisting of a target binding sequence selected from the group consisting of the target binding sequences of SEQ ID NO:4 and SEQ ID NO:5, and, optionally, a sequence required for an amplification reaction.

5,814,491

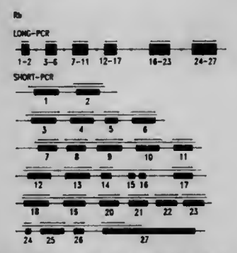
METHOD OF AND APPARATUS FOR DIAGNOSTIC DNA TESTING

Jan Vijg, 16 High Rock Ter., Newton, Mass. 02167, and Daizong Li, 25 Queensberry St., Apt. 15, Boston, Mass. 02215

Continuation of Ser. No. 471,249, Jun. 6, 1995, abandoned. This application Jan. 27, 1997, Ser. No. 789,503

Int. Cl.[6] C12P *19/34*

U.S. Cl. 435—91.2 **18 Claims**



1. A method of analyzing predetermined gene exons derived from DNA, that comprises, adding multiple primer pairs to successive groups of the gene exons followed by effecting multiplex long-distance polymerase chain reaction amplifications thereof in a common container to achieve non-overlapping resulting amplicons

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in the range of about 4.5 to 40 kb; adding further primer pairs to each of the gene exons and then effecting multiplex polymerase chain reaction amplifications thereof in the same common container to achieve resulting amplicons in the range of about 100–600 bp; and electrophoretically separating the resulting amplicons.

5,814,492

PROBE MASKING METHOD OF REDUCING BACKGROUND IN AN AMPLIFICATION REACTION

John J. Carrino, and Thomas D. Brainard, both of Gurnee, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 478,152, Jun. 7, 1995, abandoned. This application Aug. 13, 1997, Ser. No. 912,976

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04;21/02*

U.S. Cl. 435—91.2 **20 Claims**

1. In a method for amplifying nucleic acids involving repeatedly extending one or more amplification probes by the template directed addition of individual nucleotides or oligonucleotide segments in the presence of blocking that are not extendible and that hybridize with amplification probes, the improvement comprising:

a) prior to initiating an amplification reaction, providing at least one amplification probe in a masked form, the mask consisting essentially of a blocking oligo hybridized with said amplification probe to form a blocking oligo-amplification-probe heteroduplex,

wherein said blocking oligo-amplification probe heteroduplex has a $K_{50\ blocking\ oligo\text{-}probe}$ such that $K_{50\ blocking\ oligo\ probe}$ is less than $K_{50\ probe\text{-}target}$, wherein $K_{50\ probe\text{-}target}$ is the K_{50} of a target strand-amplification probe homoduplex, and wherein said blocking oligo inhibits extension of the amplification probe prior to the amplfication reaction;

(b) denaturing the blocking oligo from the amplification probe to unmask the amplification probe; and

c) carrying out the amplification reaction with the unmasked amplification probe;

wherein said blocking oligo is inhibited from interfering in the amplification reaction without physically removing the blocking oligo from the amplification mixture such that blocking oligo-amplification probe heteroduplexes and blocking oligo-target heteroduplexes do not form in substantial amounts during the amplification reaction.

5,814,493

VIRUSES AND EXPRESSION VECTORS CONTAINING LTR SIZE VARIANTS

Donald L. Robertson, Orem, and Kuhia Loren Fisher, Salt Lake City, both of Utah, assignors to Brigham Young University, Provo, Utah

Filed Aug. 18, 1994, Ser. No. 292,688

Int. Cl.[6] C12P *19/34;* **C12N** *15/79;5/10;* **C07H** *21/04*

U.S. Cl. 435—91.33 **43 Claims**

1. An isolated nucleic acid sequence which comprises at least one direct repeat of a fusion of the GR1 and the GR4 regions of a mammary tumor virus.

5,814,494

PROCESS FOR IMPROVING THE PROPERTY OF PROANTHOCYANIDINS AND FOR PREPARING AN IMPROVED PROANTHOCYANIDIN PRODUCT

Toshiaki Ariga, Noda; Hiroshi Hosoyama, Tokyo, and Katsumi Yuasa, Funabashi, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Feb. 14, 1996, Ser. No. 601,456

Claims priority, application Japan, Feb. 15, 1995, 7-049333

Int. Cl.[6] A23L *3/3544;* **C07D** *311/62;* **C09K** *15/08;* **C12P** *17/06*

U.S. Cl. 435—118 **2 Claims**

1. A process for preparing proanthocyanidins having a reduced astringency which comprises extracting grape seeds with water or an organic solvent to obtain a proanthocyanidin-containing solution; adding tannase to the resulting proanthocyanidin-containing solution or to a concentrated solution thereof for reaction therewith; and after reaction with tannase, separating the solution into a solid and a liquid phase, concentrating the liquid phase, heat-pasteurizing the liquid phase and, drying and optionally powdering the liquid phase.

5,814,495

MELANIN PRODUCTION BY STREPTOMYCES

Guy della-Cloppa; Stephen J. Garger, Jr.; Genadie G. Sverlow; Thomas H. Turpen; Laurence K. Grill, and Miles R. Chedekal, all of Vacaville, Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.

Continuation of Ser. No. 857,602, Mar. 20, 1992, Pat. No. 5,631,151, which is a division of Ser. No. 607,119, Nov. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 545,075, Jun. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 251,809, Oct. 3, 1988, abandoned. This application Mar. 14, 1995, Ser. No. 404,384

Int. Cl.[6] C12P *17/14;* **A61K** *7/44*

U.S. Cl. 435—120 **12 Claims**

1. A method for over-producing melanins, comprising:

(a) growing a melanin-producing Streptomyces microorganism in a medium comprising;

(i) casein hydrolysate or casein peptone as a nitrogen source;

(ii) $CuSO_4$-$5H_2O$;

(iii) 20–90% dissolved oxygen; and

(iv) between 1.2 and 1.6 *g/l* of L-tyrosine, or an amount sufficient to saturate the solution during fermentation, wherein said growth medium does not comprise a carbohydrate as an energy source; and

(b) extracting said melanins from the growth medium.

5,814,496

PROCESS FOR DEMETHYLATING S-METHYL-MERCAPTO COMPOUNDS

Theo Adriaan Hansen; Michael Jansen, both of Groningen, and Marc Jos E. C. van der Maarel, Haren, all of Netherlands, assignors to Quest International B.V., Naarden, Netherlands

PCT No. PCT/EP95/02883, § 371 Date Jan. 8, 1997, § 102(e) Date Jan. 8, 1997, PCT Pub. No. WO96/03518, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 19, 1995, Ser. No. 776,129

Claims priority, application European Pat. Off., Jul. 25, 1994, 94202174

Int. Cl.[6] C12P *11/00;* **C12N** *1/20*

U.S. Cl. 435—130 **13 Claims**

1. Process for preparing a mercapto compound which comprises demethylating an S-methylmercapto compound according to general formula I, wherein R-denotes an alkyl radical derived from an alkanecarboxylic acid or derivative thereof, to the corresponding mercapto compound of general formula II,

$$\underset{\text{I}}{CH_3S-R} \longrightarrow \underset{\text{II}}{HS-R}$$

using a preparation selected from the group consisting of microorganism cultures and enzyme preparations derivable from such microorganism cultures, said microorganism culture being obtained by:

(a) inoculating a suitable medium containing S-methyl-3-mercaptopropionate (MMPA) with salt marsh or marine sediment followed by one or more transfers into fresh medium containing MMPA;

(b) suppressing the growth of Bacteria, but not of Archaea in the culture.

5,814,497

ENZYMATIC HYDROLYSIS OF RACEMIC A-SUBSTITUTED 4-METHYLTHIOBUTYRONITRILES USING A NITRILASE FROM ALCALIGENES FAECALIS, GORDONA TERRAE OR RHODOCOCCUS SP

Olivier Favre-Bulle, Lyon; Maria-Claude Bontoux, Luzinay; Denis Largeau, Vourles, and André Ariagno, Francheville, all of France, assignors to Rhone-Poulenc Nutrition Animale, Antony, France

PCT No. PCT/FR95/01196, § 371 Date Mar. 20, 1997, § 102(e) Date Mar. 20, 1997, PCT Pub. No. WO96/09403, PCT Pub. Date Mar. 28, 1996

PCT Filed Sep. 19, 1995, Ser. No. 809,184

Claims priority, application France, Sep. 22, 1994, 94 11301; Mar. 7, 1995, 95 02615

Int. Cl.[6] C12P *11/00*

U.S. Cl. 435—130 **15 Claims**

1. A process for preparing a racemic α-substituted 4-methylthiobutyric acid, comprising:

(a) hydrolyzing a racemic α-substituted 4-methylthiobutyronitrile with a nitrilase from a microorganism selected from the group consisting of *Alcaligenes faecalis* (ATCC 8750), Rhodococcus sp. HT 29-7 (FERM BP-3857), and *Gordona terrae* MA-1 (FERM BP-4535); and

(b) recovering the racemic α-substituted 4-methylthiobutyric acid.

5,814,498

PROCESS FOR THE RECOVERY OF ORGANIC ACIDS AND AMMONIA FROM THEIR SALTS

K. N. Mani, Decatur, and D. Kent Hadden, Mt. Zion, both of Ill., assignors to Archer Daniels Midland Company, Decatur, Ill.

Filed Apr. 29, 1996, Ser. No. 639,831

Int. Cl.[6] C12P *7/40;7/56;* **B01D** *61/00;15/04*

U.S. Cl. 435—136 **11 Claims**

1. A process for recovering organic acids from their ammonium salts, said process comprising the steps of:

(a) providing a clarified incoming feed stream of an organic ammonium salt solution containing multivalent metal contaminants;

(b) providing said feed stream of organic ammonium salt solution provided in step (a) by a process of nanofiltration to reduce divalent metal contaminants in said solutions, said metal contaminants being reduced by said nanofiltration to a level below their solubility in an ammonium salt solution;

(c) passing the ammonium salt solution outflow of step (b) directly into a multi-compartment electrodialysis unit comprising bipolar and anion exchange membranes, and

(d) applying a direct current driving force across said electrodialysis unit to obtain a concentrated organic acid product and a depleted salt stream containing dissolved ammonia.

5,814,499

DNA ENCODOING PHAGE ABORTIVE INFECTION PROTEIN FROM LACTOCOCCUS LACTIS AND METHOD OF USE THREEOF

Sylvain Moineau; Barbara J. Holler, both of Rochester, Minn.; Peter A. Vandenbergh, Sarasota, Fla.; Ebenezer R. Vedamuthu, and Jeffrey K. Kondo, both of Rochester, Minn., assignors to Quest International Flavors & Food Ingredients Company, division of Indopco, Inc., Bridgewater, N.J.

Filed Dec. 1, 1995, Ser. No. 565,907

Int. Cl.[6] C12N *15/63;1/21;* **C07H** *21/04*

U.S. Cl. 435—172.1 **35 Claims**

1. An isolated DNA encoding a protein designated as AbiE contained in plasmid pSRQ800 which in a *Lactococcus lactis*

increases resistance to phages by aborting infection of the *Lactococcus lactis* by phages.

5,814,500

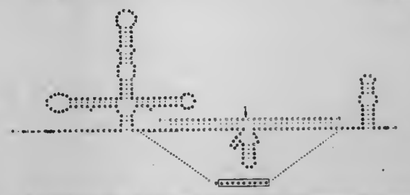
DELIVERY CONSTRUCT FOR ANTISENSE NUCLEIC ACIDS AND METHODS OF USE

Harry C. Dietz, Towson, Md., assignor to The Johns Hopkins University School of Medicine, Baltimore, Md.

Filed Oct. 31, 1996, Ser. No. 742,943

Int. Cl.[6] C12Q *1/02*

U.S. Cl. 435—172.3 **11 Claims**



1. A nucleic acid construct for suppressing expression of a target gene, comprising:

an antisense nucleic acid sequence directed to said target gene;

an unmodified, naturally occurring 5' U1 snRNA stem loop structure 5' of said antisense nucleic acid sequence;

a pol II promoter region 5' of said 5' U1 snRNA stem loop structure; and

a naturally occurring 3' U1 snRNA stem loop structure 3' of said antisense nucleic acid sequence,

wherein said expression of said target gene is suppressed by at least 75% of the normal level of expression.

10. A method for suppression of expression of a target gene comprising administering the nucleic acid construct of claim 1 to an isolated cell, wherein said construct is expressed at a level sufficient to suppress expression of said target gene.

5,814,501

PROCESS FOR MAKING DUST-FREE ENZYME-CONTAINING PARTICLES FROM AN ENZYME-CONTAINING FERMENTATION BROTH

Nathaniel T. Becker, Burlingame, Calif., and Richard P. Crowley, Rochester, N.Y., assignors to Genencor International, Inc., Rochester, N.Y.

Continuation of Ser. No. 24,891, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 533,721, Jun. 4, 1990, abandoned. This application Feb. 15, 1995, Ser. No. 390,264

Int. Cl.[6] C12N *11/00;9/98;11/10;* **C11D** *7/42*

U.S. Cl. 435—174 **3 Claims**

1. A process for providing a dry, dust-free particle from an enzyme containing fermentation broth, the process comprising:

a) introducing hydratable core particles into a reaction chamber of a fluidized bed spray-coater or building up hydratable core particles in reaction chamber of a fluidized bed spray-coater;

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b) providing a fermentation broth which has been filtered to remove while cells and cell debris therefrom, the broth containing from about 5% to about 100% w/w of the total solids therein of a water soluble enzyme in solution produced in the fermentation broth and a total solids content of about 31% to about 55% in the fermentation broth such that the broth has a viscosity of 10–5,000 cps at room temperature;

c) spraying the broth onto the core particles in the sray-coater and evaporating liquid to leave a film of broth solids coated on the core particles, the broth solids added to the core particles providing a total dry weight gain of from about 1% to about 100% w/w; and

d) spraying a coating agent dissolved in liquid on the particles containing the coating of the broth solids from step c) in spray-coater and evaporating liquid to leave the coating agent as a coating over the coating of broth solids such that the total broth solids and coating agent added to the core particles provide a total dry weight gain of from about 1% to about 100% w/w over the initial weight of the uncoated core particles.

5,814,502

STABILIZED LIQUID MIXTURES FOR LABELLING NUCLEIC ACIDS

Hans-Joachim Hoeltke, Tutzing; Irmgard Obermaier, Penzberg, and Georg Nesch, Raisting-Sölb, all of Germany, assignors to Boehringer Mannheim, GmbH, Mannheim, Germany

Continuation of Ser. No. 326,967, Oct. 21, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,997

Claims priority, application Germany, Oct. 23, 1993, 43 36 266.4

Int. Cl.[6] C12N *9/96;9/12;* **C12Q** *1/68;1/48;* **C12P** *19/34*

U.S. Cl. 435—188 **10 Claims**

1. A stable pre-mixed composition for synthesizing or labelling nucleic acids comprising:

a) an enzyme which synthesizes or labels nucleic acids,

b) reaction buffer,

c) between 30% and 60% (v/v) glycerin, and

d) at least one nucleoside triphosphate, wherein the composition is liquid when a) through d) are mixed together and stored at −20° C., and the composition does not exhibit a loss of enzyme activity upon storage over a period of at least 12 months at −20° C. to +4° C.

5,814,503

FUSION PROTEINS COMPRISING CELL CYCLE REGULATORY PROTEINS

Steven Kovacevic, Indianapolis; Keith A. Otto, Greenwood, and Ramachandra N. Rao, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 19, 1996, Ser. No. 770,761

Int. Cl.[6] C12N *9/12;15/52*

U.S. Cl. 435—188 **5 Claims**

1. A fusion protein comprising human cyclin D1 and human cyclin dependent kinase 4, said fusion protein having kinase activity

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5,814,504

PROTEIN INVOLVED IN REGENERATING FIREFLY LUCIFERIN

Naoki Kajiyama, Chiba, Japan, assignor to Kikkoman Corporation, Noda, Japan

Filed Jun. 5, 1997, Ser. No. 869,996

Int. Cl.[6] C12N *9/62;* **C12Q** *1/66;* **A63J** *1/00*

U.S. Cl. 435—189 **20 Claims**

1. An isolated and purified protein obtained from a firefly species which converts firefly oxyluciferin and D-cysteine to firefly luciferin.

5,814,505

PROCESS FOR PRODUCING GLYCINE-N-METHYL TRANSFERASE USING RECOMBINANT DNA

Hirokazu Matsukawa, and Tsuyoshi Fujita, both of Osaka-fu, Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1995, Ser. No. 489,141

Claims priority, application Japan, Jul. 22, 1994, 6-191197

Int. Cl.[6] C12N *9/10;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—193 **20 Claims**

1. A recombinant vector containing a mutated recombinant rat glycine N-methyl transferase (GMT) gene on a plasmid, said recombinant vector is prepared by digesting with HindIII the DNA obtained from PCR amplification with a DNA containing rat GMT cDNA as template and PCR primers having the sequence of SEQ ID NO:3 and SEQ ID NO:4, and followed by inserting the HindIII-digested DNA into the plasmid digested with HindIII.

5,814,506

OVER-EXPRESSION AND PURIFICATION OF A TRUNCATED THERMOSTABLE DNA POLYMERASE BY PROTEIN FUSION

Huimin Kong, Wenham; John J. Pelletier, Amesbury, and Jason M. Aliotta, Newton, all of Mass., assignors to New England Biolabs, Inc., Beverly, Mass.

Filed Aug. 2, 1995, Ser. No. 510,215

Int. Cl.[6] C12N *9/12;15/54;15/62*

U.S. Cl. 435—194 **15 Claims**

11. A method for producing a recombinant *Bacillus stearothermophilus* DNA polymerase I, SER ID NO: 2, comprising:

(a) isolating DNA which codes for a said *Bacillus stearothermophilus* DNA polymerase I;

(b) fusing the isolated DNA of step (a) to a DNA fusion partner;

(c) inserting the DNA of step (b) into a cloning vector;

(d) transforming a host cell with the vector of step (c);

(e) culturing the host cell of step (d) under conditions suitable for expression; and

(f) recovering a hybrid polypeptide the BstI DNA polymerase fused to the expression product of the DNA coding for the fusion partner.

5,814,507

κ/μ-LIKE PROTEIN TYROSINE PHOSPHATASE, PTP λ

Jill Cheng, Burlingame, and Laurence A. Lasky, Saulito, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed May 24, 1996, Ser. No. 652,971

Int. Cl.[6] C12N *9/16;* **C12P** *21/08*

U.S. Cl. 435—196 **14 Claims**

1. An isolated receptor protein tyrosine phosphatase λ polypeptide which dephosphorylates phosphorylated tyrosine residues, said polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence shown in FIG. 1 (SEQ ID NO: 2);

(b) an amino acid sequence which is encoded by a nucleic acid molecule that hybridizes under stringent conditions to a nucleic acid molecule that encodes the amino acid sequence of (a).

5,814,508

PREPARATION OF LACTAMS FROM ALIPHATIC α,ω-DINITRILES

Robert Di Cosimo, Rockland, Del.; Robert Donald Fallon, Elkton, Md.; John Edward Gavagan, and Frank Edward Herkes, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 650,073, May 17, 1996. This application Aug. 13, 1997, Ser. No. 910,260

Int. Cl.[6] C12N *9/78;9/88;* **C12P** *17/10;17/12*

U.S. Cl. 435—227 **1 Claim**

1. A method of treating a whole cell catalyst to select for a regioselective nitrilase activity or a nitrile hydratase activity capable of catalyzing the conversion of aliphatic α,ω-dinitriles to the corresponding ω-cyanocarboxylic acid ammonium salt, the whole cell catalyst characterized by a desirable regioselective nitrilase activity or nitrile hydratase activity as well as an undesirable non-regioselective nitrilase or nitrile hydratase activity, the method comprising:

heating the whole cell catalyst to a temperature of about 35° C. to 70° C. for between 10 and 120 minutes wherein the undesirable non-regioselective nitrilase activity or nitrite hydratase activity is destroyed and the desirable regioselective nitrilase or nitrile hydratase activity is preserved.

5,814,509

PROSTACYCLIN SYNTHASE DERIVED FROM HUMAN

Tadashi Tanabe, 18-13, Higashitoyonaka-cho 3-chome, Toyonaka-shi, Osaka 569, Japan

PCT No. PCT/JP95/00838, § 371 Date Dec. 28, 1995, § 102(e) Date Dec. 28, 1995, PCT Pub. No. WO95/30013, PCT Pub. Date Nov. 9, 1995

PCT Filed Apr. 27, 1995, Ser. No. 578,709

Claims priority, application Japan, Apr. 28, 1994, 6-114316

Int. Cl.[6] A01N *43/04;* **C12N** *9/90;5/00;* **C07H** *21/04*

U.S. Cl. 435—233 **19 Claims**

1. An isolated DNA comprising a DNA having a nucleotide sequence encoding an amino acid sequence of a human-originated prostacyclin synthase depicted in Sequence Listing, Sequence No. 15.

5,814,510

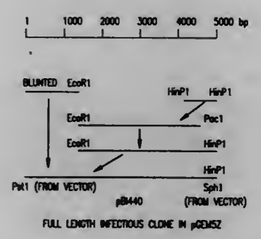
ATTENUATED CANINE PARVOVIRUS VACCINE

Colin R. Parrish, Ithaca, N.Y.; Allen Gruenberg, Wellington, New Zealand, and Leland E. Carmichael, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 8, 1994, Ser. No. 336,345

Int. Cl.[6] C12N *7/04;7/00;* **A61K** *39/12;* **C07H** *21/04*

U.S. Cl. 435—236 **33 Claims**



FULL LENGTH INFECTIOUS CLONE IN pGDI452

1. A DNA molecule encoding an attenuated canine parvovirus genome, comprising the nucleotide sequence as depicted in SEQ. ID. NO. 1.

5,814,511

HUMAN BREAST EPITHELIAL CELL TYPE WITH STEM CELL AND LUMINAL EPITHELIAL CELL CHARACTERISTICS

Chia-Cheng Chang, and James E. Trosko, both of Okemos, Mich., assignors to Michigan State University, East Lansing, Mich.

Division of Ser. No. 308,118, Sep. 16, 1994, Pat. No. 5,530,317. This application Nov. 16, 1995, Ser. No. 558,786

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.2 **12 Claims**

1. A substantially purified human breast epithelial cell comprised of the following characteristics:

cell morphology: variable in shape;

colony morphology: boundary smooth; and

when subjected to growth in a medium comprised of fetal bovine serum, the cell has the following expression of:

epithelial membrane antigen: positive;

keratin 18: positive; and

keratin 14: negative.

5,814,512

MICROORGANISM HAVING ALL THE IDENTIFYING CHARACTERISTICS OF ABSIDA FERM BP-4599 FOR PRODUCING PURPUROGALLIN DERIVATIVES

Yuki Takehana, Fujisawa, Japan, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 429,457, Apr. 27, 1995, Pat. No. 5,650,439. This application Feb. 13, 1997, Ser. No. 800,140

Claims priority, application European Pat. Off., May 2, 1994, 94106823

Int. Cl.[6] C12N *1/14;* **C12P** *7/26;7/02;* **C07C** *59/76*

U.S. Cl. 435—254.1 **2 Claims**

1. A biologically pure culture of the microoorganism of the genus Absidia, having all the identifying characteristics of FERM BP-4599.

5,814,513

METHOD OF REMOVING CELLS FROM FERMENTATION BROTH THROUGH MEMBRANE

Toshiya Tanabe, and Tohru Nakamura, both of Kawaski, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 15, 1996, Ser. No. 732,116

Claims priority, application Japan, Oct. 13, 1995, 7-265275

Int. Cl.[6] C12N *1/02*

U.S. Cl. 435—261 **8 Claims**

1. A method for improving the permeation rate of an Escherichia cell-containing fermentation broth through a microfiltration or an ultrafiltration membrane consisting of adding an effective amount of polyethyleneimine to the fermentation broth to form a mixture, adjusting the pH of the mixture to from 3 to 7, heating the mixture to from 50° C. to 130° C. and then filtering the mixture through a microfiltration or an ultrafiltration membrane to separate the cells.

5,814,514

BIODEGRADATION OF THE GASOLINE OXYGENATES

Robert Jon Steffan, Newtown; Charles Whitman Condee, Morrisville; Kevin Rock McClay, Morrisville; Jennifer Diane Michelson, Yardley, all of Pa., and Mary F. DeFlaun, Mercerville, N.J., assignors to Envirogen, Inc., Lawrenceville, N.J.

Filed Jul. 10, 1996, Ser. No. 677,516

Int. Cl.[6] C07C *00/00*

U.S. Cl. 435—262 **22 Claims**

1. A method for degrading an ether comprising contacting said ether with a propane-oxidizing bacteria.

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5,814,515

METHOD OF DISSOLUTION OF SAUSAGE SKINS AND OTHER CELLULOSIC SUBSTANCES BY MEANS OF AN ENZYME SOLUTION

Liisa Viikari, Helsinki; Annikka Mustranta, Espoo; Osmo Ojamo, Lohja; Merja Itävaara, Kirkkonummi, and Tor Johansson, Tammisaari, all of Finland, assignors to Eriksson Capital AB, Finland

Filed Dec. 21, 1995, Ser. No. 576,826
Claims priority, application Finland, Dec. 23, 1994, 946053
Int. Cl.[6] C07G *17/00;* A23G *1/00*
U.S. Cl. 435—267 12 Claims

1. Method of destruction of sausage skins and other mainly cellulosic substances by means of dissolution with an enzyme solution, comprising the following steps:

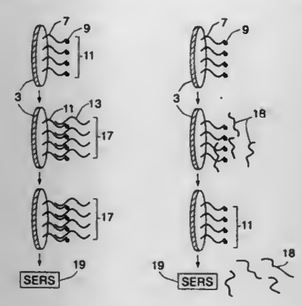
a) adding cellulase enzymes to a reactor containing a water solution;
b) adding the substances to be dissolved to the reactor, either before or after adding the cellulose enzymes;
c) dissolving the substances to be dissolved partly or completely, and then;
d) adding to the reactor a new amount of substances to be dissolved;
e) when the enzymes have been absorbed in the new substances to be dissolved, resolving the solution containing the described substances by separating the solution and the substances to be dissolved from each other, whereby
f) water is added to the substances to be dissolved and if desired, steps c–f are repeated a wished amount of times.

5,814,516

SURFACE ENHANCED RAMAN GENE PROBE AND METHODS THEREOF

Tuan Vo-Dinh, Knoxville, Tenn., assignor to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Filed Oct. 13, 1995, Ser. No. 543,212
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—287.2 18 Claims



1. A Surface-Enhanced Raman (SER) gene probe biosensor comprising:

a) a support means;
b) a SER gene probe having two oligonucleotide strands labeled with at least one surface-enhanced Raman Scattering (SERS) label intercalated between said two oligonucleotide strands; and
c) a SERS active substrate disposed on said support means and having at least one of said SERS gene probe adsorbed thereon.

5,814,517

DNA SPACER REGULATORY ELEMENTS RESPONSIVE TO CYTOKINES AND METHODS FOR THEIR USE

H. Martin Seidel, and I. Peter Lamb, both of San Diego, Calif., assignors to Ligand Pharmaceuticals, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 228,935, Apr. 14, 1994, abandoned. This application Mar. 27, 1995, Ser. No. 410,779
Int. Cl.[6] C12N *15/85;15/11;* C07H *21/04*
U.S. Cl. 435—325 19 Claims

1. A DNA construct comprising a cytokine-responsive regulatory element operably linked to a promoter, which promoter is operably linked to a heterologous coding sequence, wherein the coding sequence is under the transcriptional control of the regulatory element and the promoter, and further wherein the regulatory element has a nucleotide sequence selected from the group consisting of TTCNNGAA (SEQ ID NO. 5), $TTAN_yTAA$ (SEQ ID NO. 13) and $TTCN_yTAA$ (SEQ ID NO. 166), where N is independently selected from A,T,C or G and y is 3 or 4.

10. A cultured or isolated host cell transfected with the DNA construct of claim 1.

5,814,518

Patent Not Issued For This Number

5,814,519

SUPRESSOR OF HIV-1 REPLICATION AND TRANSCRIPTION

Dani P. Bolognesi; Chin-Ho Chen; Michael Greenberg; Kent Weinhold, and Simon F. Lacey, all of Durham, N.C., assignors to Duke University Medical Center, Durham, N.C.

Division of Ser. No. 471,430, Jun. 6, 1995, which is a continuation-in-part of Ser. No. 38,387, Mar. 29, 1993, Pat. No. 5,627,023. This application Jun. 7, 1995, Ser. No. 488,527
Int. Cl.[6] C12N *5/08;5/22*
U.S. Cl. 435—372.3 7 Claims

1. A permanently established lymphocyte cell line that expresses the CD8 protein on the cell surface and expresses a $CD8^+$ suppressor molecule that inhibits HIV replication.

5,814,520

TRYPTAMINE PRODUCING TRYPTOPHAN DECARBOXYLASE GENE OF PLANT ORIGIN

Vincenzo De Luca, Riviére des Prairies; Normand Brisson, Montreal, and Wolfgang Gebhard Walter Kurz, Saskatoon, all of Canada, assignors to National Research Council Canada, Ottawa, Canada

Continuation of Ser. No. 82,418, Jun. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 758,493, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 314,879, Feb. 24, 1989, abandoned. This application Apr. 20, 1995, Ser. No. 426,163
Int. Cl.[6] C12N *5/04;1/21;15/60*
U.S. Cl. 435—419 6 Claims

1. A DNA fragment comprising an isolated and purified DNA sequence encoding a plant tryptophan decarboxylase, wherein the plant decarboxylase has the DNA sequence corresponding to nucleotides 69 to 1572 of the sequence designated TDC in FIG. 3.

5,814,521

METAL ION DETERMINATION BY SANDWICH AGGREGATION ASSAY

Eddy Chapoteau, Brooklyn; Jonathan Craine, Monsey; Bronislaw P. Czech, Peekskill, all of N.Y.; Anand Kumar, Pleasanton, and Koon-wah Leong, Sunnyvale, both of Calif., assignors to Bayer Corporation, Tarrytown, N.Y.

Filed Aug. 28, 1996, Ser. No. 703,982
Int. Cl.[6] G01N *33/20;35/546*
U.S. Cl. 436—74 44 Claims

1. A method for determining the amount of a polyvalent metal ion in a liquid matrix using a sandwich aggregation assay, comprising:

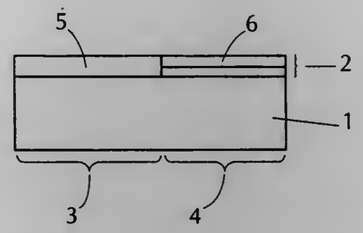
(a) contacting the polyvalent metal ion with a reagent comprising a chelating agent, wherein the chelating agent is capable of forming at least a 2:1 stoichiometric ratio complex of chelating agent to polyvalent metal ion;
(b) linking the chelating agent to a carrier in the liquid matrix wherein a plurality of carriers linked to complexed chelating agents aggregate, thereby causing an increase in light absorbance which is proportional to the concentration of the polyvalent metal ions in the liquid matrix; and
(c) measuring the resulting aggregation in the liquid matrix as a function of the amount of the polyvalent metal ion present in the liquid matrix.

5,814,522

MULTILAYER ANALYTICAL ELEMENT FOR THE DETERMINATION OF AN ANALYTE IN A LIQUID

Volker Zimmer, Ludwigshafen; Heinz Macho, Fürth, and Rolf Lerch, Ilvesheim, all of Germany, assignors to Boeringer Mannheim GmbH, Mannheim, Germany

Filed Jun. 20, 1996, Ser. No. 668,059
Claims priority, application Germany, Jun. 24, 1995, 195 23 049.3
Int. Cl.[6] G01N *33/48*
U.S. Cl. 436—170 9 Claims



8. Method for determination of a analyte in a liquid, comprising contacting said liquid to a multilayer analytical element which has a sample application zone and a detection zone arranged side by side, said multilayer analytical element comprising a fleece and a porous polyamide, polyvinyl difluoride, polyether sulfone or polysulfone membrane, each of which transports liquid, said porous membrane transporting liquid more slowly than said fleece, wherein a portion of said porous membrane is in said detection zone, and contains a reagent which forms a signal with said analyte and is in fluid contact with said fleece, said fluid contact permitting passage of liquid from said fleece to said porous membrane, said porous membrane, and

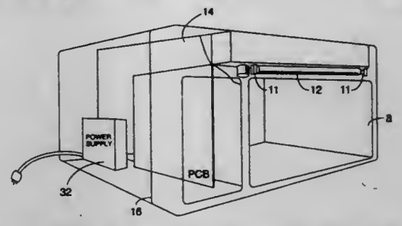
determining formation of said signal as determination of said analyte.

5,814,523

METHOD OF IRRADIATING BIOLOGICAL SPECIMENS

William C. Zimlich, Jr., and Joseph A. Sorge, both of San Diego, Calif., assignors to Stratagene, La Jolla, Calif.

Continuation of Ser. No. 742,442, Nov. 1, 1996, abandoned, which is a continuation of Ser. No. 384,564, Feb. 6, 1995, abandoned, which is a continnation of Ser. No. 999,434, Dec. 30, 1992, Pat. No. 5,395,591, which is a division of Ser. No. 686,491, Apr. 17, 1991, Pat. No. 5,288,647, which is a division of Ser. No. 189,285, May 2, 1988, abandoned. This application Jul. 18, 1997, Ser. No. 896,717
Int. Cl.[6] G01J *1/04*
U.S. Cl. 436—174 3 Claims



1. A method of irradiating a polynucleotide specimen on a substrate, using an apparatus having:

(a) a chamber having a repository for the substrate;
(b) an ultraviolet lamp fixture disposed within the chamber, which fixture carries an ultraviolet lamp to illuminate the repository;
(c) an energy detector which can provide an indication of the total ultraviolet radiation dose received on the repository, the energy detector having:
(i) a sensor disposed in the chamber, which provides a signal corresponding to the ultraviolet flux on the repository;
(ii) a detector circuit connected to the sensor, so as to provide an indication of the total ultraviolet radiation dose received on the repository based on the signal received from the sensor over time;
(d) a control circuit connected to the detector circuit and the lamp fixture, which control circuit can de-energize the lamp fixture upon detector of a selected or a predetermined total ultraviolet radiation dose by the energy detector;

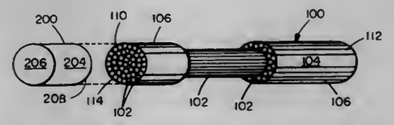
the method comprising placing the substrate carrying the polynucleotide into the chamber, then energizing the lamp fixture so that the polynucleotide specimen will be irradiated with ultraviolet radiation from the lamp until the control circuit de-energizes the lamp upon detection of the selected or predetermined total ultraviolet radiation dose.

5,814,524

OPTICAL SENSOR APPARATUS FOR FAR-FIELD VIEWING AND MAKING OPTICAL ANALYTICAL MEASUREMENTS AT REMOTE LOCATIONS

David R. Walt, Lexington; Karri L Michael, Somerville, and Suneet Chadha, Melrose, all of Mass., assignors to Trustees of Tufts College, Medford, Mass.

Filed Dec. 14, 1995, Ser. No. 572,005
Int. Cl.[6] G01N *33/543;33/552*
U.S. Cl. 436—518 12 Claims



1. An optical sensor apparatus for far-field viewing and detection of at least one species of analyte in a remotely-position fluid

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sample, the detection of a species of analyte being correlatable with far-field optical determination, said optical sensor apparatus comprising:

a far-field imaging fiber comprised of

(a) a preformed, unitary fiber optic array comprising a plurality of individually clad, fiber optical stands disposed co-axially along their lengths and being of predetermined configuration and dimensions, said preformed unitary fiber optic array having two discrete optic array ends each of which is formed of multiple strand end faces and presents a discrete optic array surface for introduction and conveyance of light energy, and

(b) a gradient index lens joined to and optically aligned with an optic array end surface of said unitary fiber optic array for far-field viewing of an object located within a predetermined range of optical distances from said lens;

a remotely-positioned solid substrate spaced apart from but lying within said predetermined range of optical distances from said imaging fiber, said solid substrate providing, at least one discrete reaction surface in alignment with and suitable for far-field viewing via said imaging fiber,

at least one light energy absorbing indicator ligand disposed on said discrete reaction surface of said remotely-positioned solid substrate, said indicator ligand providing a characteristic detectable optical response of time-varying light intensity at at least one wavelength, said response being indicative of an individual species of analyte when present in a fluid sample;

means for placing a fluid sample into reactive contact with said light energy absorbing indicator ligand on said reaction surface of said remotely-positioned solid substrate;

means for introducing excitation light energy to said light energy absorbing indicator ligand on said reaction surface of said remotely-positioned solid substrate; and

means for detecting light energy emerging from said indicator ligand on said reaction, surface of said remotely-positioned solid substrate which has been introduced and collected by said imaging fiber, said detected emerging light energy serving as a measure for determining a species of analyte in the fluid sample.

5,814,525

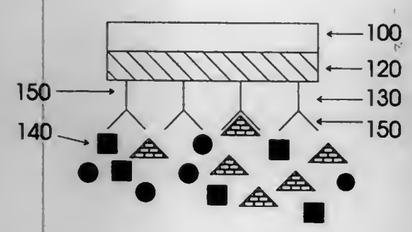
PIEZOELECTRIC BIOSENSOR WITH A LADDER POLYMER SUBSTRATE COATING

Clifford L. Renschler, Tijeras; Christine A. White, Albuquerque, both of N. Mex., and Robert M. Carter, New Orleans, La., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Jan. 25, 1996, Ser. No. 591,936

Int. Cl.[6] G01N *33/551;33/552*

U.S. Cl. 436—524 **17 Claims**



1. A piezoelectric-based biosensor, comprising:

a piezoelectric sensing element;

a substrate coating on said piezoelectric sensing element, wherein the substrate coating comprises a ladder polymer; and

at least one biomolecule immobilized onto said substrate coating for the purpose of sensing at least one analyte species.

5,814,526

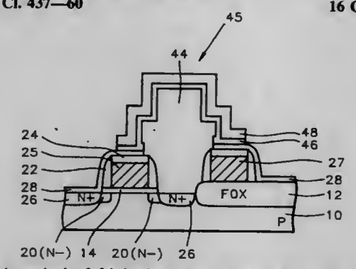
METHOD OF FORMING A DRAM STACKED CAPACITOR WITH A TWO STEP LADDER STORAGE NODE

Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Jun. 14, 1996, Ser. No. 665,118

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—60 **16 Claims**



1. A method of fabrication of a stacked capacitor having a storage electrode with a two step ladder cross sectional shape, comprising the steps of

a) providing a MOS (metal oxide semiconductor) device having source and drain regions in a substrate;

b) forming first insulation layer over said MOS device;

c) forming a first conductive layer and a first masking layer over said first insulation layer;

d) patterning said first masking layer and said first conductive layer to form a first ridge over at least portions of said source region, said first ridge having sidewalls;

e) forming a first dielectric layer over said first conductive layer;

f) anisotropically etching said first dielectric layer forming spacers on the sidewalls of said ridge;

g) anisotropically etching said first conducive layer using said spacers and said first masking layer as an etch mask thereby forming said storage electrode having a two step ladder cross sectional shape from the remaining first polysilicon layer;

h) removing said first masking layer and said spacers;

i) forming a capacitor dielectric layer over at least said storage electrode;

j) forming a top plate electrode over said capacitor dielectric layer to form said stacked capacitor.

5,814,527

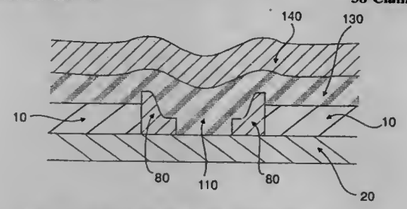
METHOD OF MAKING SMALL PORES DEFINED BY A DISPOSABLE INTERNAL SPACER FOR USE IN CHALCOGENIDE MEMORIES

Graham R. Wolstenholme, Boise; Steven T. Harshfield, Emmett; Raymond A. Turi, Boise; Fernando Gonzalez, Boise; Guy T. Blalock, Boise, and Donwon Park, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 22, 1996, Ser. No. 686,174

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—5 **38 Claims**



1. A method of fabricating a pore, comprising:

applying a layer of a first material onto a substrate material;

forming an edge feature in said layer of said first material;

applying a layer of a second material onto said edge feature of said layer of said first material;

applying a layer of a third material onto said layer of said second material;

removing a portion of said layer of said third material; and

removing a portion of said layer of said second material to define a pore in said layer of said second material.

5,814,528

FABRICATION METHOD OF SEMICONDUCTOR TEST PIECE

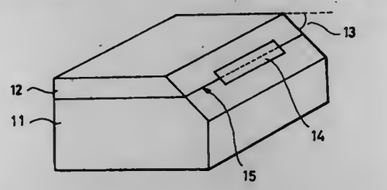
Byeong Kwon Ju; Myung Hwan Oh; Yun Hi Lee, all of Seoul; Nam Yang Lee, Seongnam; Keun Ha Koh, Seoul, and Dong Ky Shin, Kyungsangbook-Do, all of Rep. of Korea, assignors to Korea Intstitute of Science and Technology, Seoul, Rep. of Korea

Filed Oct. 10, 1996, Ser. No. 729,064

Claims priority, application Rep. of Korea, May 31, 1996, 1996/19185

Int. Cl.[6] H01L *21/02;21/304*

U.S. Cl. 438—16 **4 Claims**



1. A fabrication method of a test piece for observing non-contact regions in a pair of bonded semiconductor substrates, comprising:

thinning one substrate of a pair of bonded semiconductor substrates;

grade-polishing the thinned semiconductor substrate and the bonded semiconductor substrates to have a predetermined graded angle relative their bonded surfaces; and

dry-etching an area around the bonded surfaces of the grade-polished semiconductor substrates to reveal faults on the etching pattern.

5,814,529

METHOD FOR PRODUCING A SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING A THIN FILM TRANSISTOR AND A CAPACITOR

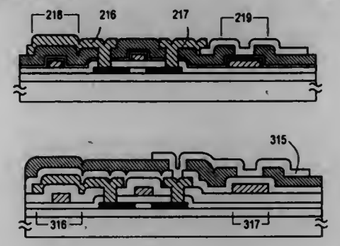
Hongyong Zhang, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Jan. 16, 1996, Ser. No. 585,916

Claims priority, application Japan, Jan. 17, 1995, 7-022256

Int. Cl.[6] H01L *21/84*

U.S. Cl. 438—30 **6 Claims**



1. A method for producing a semiconductor integrated circuit comprising the steps of:

forming an interlayer insulator including at least upper and lower layers each having different dry etching characteristics;

etching the upper layer of the interlayer insulator using a first mask, wherein the lower layer of the interlayer insulator is used as an etching stopper;

forming a second mask to cover a portion of the lower layer of the interlayer insulator exposed by the etching steps, said second mask is a transparent conductive material;

selectively etching the lower layer of the interlayer insulator using the second mask;

forming a contact hole in one portion that the upper and lower layers of the interlayer insulator are etched; and

forming a capacitor in another portion that only the upper layer of the interlayer insulator is etched.

5,814,530

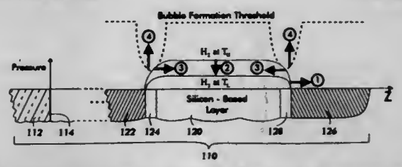
PRODUCING A SENSOR WITH DOPED MICROCRYSTALLINE SILICON CHANNEL LEADS

Chuang-Chuang Tsai, San Jose; William W. Yao, Los Altos, and Ronald T. Fulks, Mountain View, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1996, Ser. No. 721,813

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—30 **3 Claims**



1. A method of forming circuitry at a surface of a substrate, the method comprising:

forming a gate lead;

depositing a first insulating layer over the gate lead;

depositing a first semiconductor layer over the first insulating layer; the first semiconductor layer including intrinsic microcrystalline silicon and having lower and upper sides and less than 5 atomic percent of hydrogen;

depositing a second insulating layer over the first semiconductor layer and patterning the second insulating layer to form an insulating island over a channel region in the first semiconductor layer; the channel region extending between a first connecting region and a second connecting region in the first semiconductor layer; the first and second connecting regions being adjacent to the insulating island and being exposed by the act of patterning the second insulating layer;

doping exposed parts of the first semiconductor layer using the insulating island as a mask to form first and second conductive regions immediately adjacent the first and second connecting regions, respectively;

depositing a conductive metal layer over the insulating island and exposed parts of the first semiconductor layer;

patterning the conductive metal layer and the first and second conductive regions of the first semiconductor layer to form first and second channel leads of a thin film transistor with a channel formed in the channel region in the first semiconductor layer; the first and second channel leads including first and second semiconductor leads, respectively, in the first semiconductor layer; the first semiconductor lead being in electrical contact with the first connecting region; the second semiconductor lead being in electrical contact with the second connecting region;

depositing a second semiconductor layer over the conductive metal layer; the second semiconductor layer including silicon-based material; and

patterning the second semiconductor layer to form a sensing element; the conductive metal layer being exposed over the insulating island and over the first and second connecting regions by the act of patterning the second semiconductor

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layer; the first channel lead of said thin film transistor being electrically connected for receiving signals from the sensing element through the conductive metal layer; the thin film transistor responding to signals from the gate lead by providing signals received from the sensing element to the second channel lead of said thin film transistor;

the method being performed so that the first semiconductor layer has a structure that prevents formation of bubbles at the lower and upper sides of the first semiconductor layer during the acts of depositing and patterning the second semiconductor layer.

5,814,531

METHOD FOR FORMING SEMICONDUCTOR LASER EMITTING LIGHT FROM SLANT PLANE

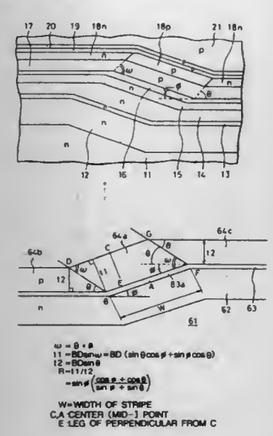
Chikashi Anayama; Hiroshi Sekiguchi, and Makoto Kondo, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 275,427, Jul. 15, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,697

Claims priority, application Japan, Aug. 30, 1993, 5-214479

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—31 **4 Claims**



1. A method of manufacturing a semiconductor laser, comprising the step of a vapor phase growth of growing on a patterned semiconductor substrate an active layer and an upper cladding layer including an AlGaInP layer, the substrate including a first flat plane portion; a second flat plane portion, and a stripe-shaped slant plane portion connecting the first flat plane portion and the second flat plane portion, wherein the upper cladding layer is grown under a condition substantially satisfying

$$R=aTg^2+bTg+cTg+d\alpha \text{ and satisfying } R>1,$$

where R=t1/t2 is a slant plane ratio, t2 is a thickness of the flat plane portions of the upper cladding layer, t1 is a thickness of the slant plane portion thereof, Tg is a growth temperature, α is a V/III ratio of growth materials, $a=1.9999\times10^{-4}$, b=−0.297985, c=111.505, and $d=1.6667\times10^{-3}$.

5,814,532

METHOD OF MANUFACTURING SEMICONDUCTOR LASER

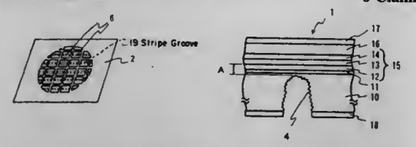
Jun Ichihara, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 29, 1997, Ser. No. 848,677

Claims priority, application Japan, Apr. 30, 1996, 8-109197

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—33 **6 Claims**



1. A method of manufacturing a semiconductor laser device, comprising the steps of:

(a) forming, on a substrate, a light emitting layer forming portion of an overlying structure having a first conductivity type cladding layer, an active layer and a second conductivity type cladding layer;

(b) growing a first conductivity type semiconductor layer on said second conductivity type cladding layer of said light emitting layer forming portion, and forming a stripe groove by etching said first conductivity type semiconductor layer to therein provide a current-restriction layer;

(c) forming a second conductivity type semiconductor layer on said current-restriction layer;

(d) forming street grooves in a lattice form in said substrate in directions parallel with and perpendicular to said stripe groove; and

(e) cleaving at said light emitting layer forming portion along said street grooves which are perpendicular to said stripe groove to therein divide said substrate into chips.

5,814,533

SEMICONDUCTOR LIGHT EMITTING ELEMENT AND MANUFACTURING METHOD THEREFOR

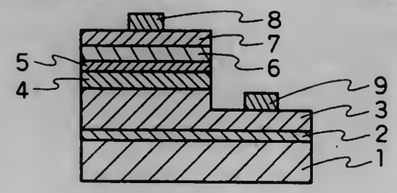
Yukio Shakuda, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 31, 1995, Ser. No. 509,231

Claims priority, application Japan, Aug. 9, 1994, 6-187341; Aug. 22, 1994, 6-196851; Aug. 22, 1994, 6-196853; Aug. 26, 1994, 6-202479

Int. Cl.[6] H01L *21/203;* **C30B** *25/22*

U.S. Cl. 438—46 **7 Claims**



1. A manufacturing method of a semiconductor light emitting element comprising the steps of:

(a) laminating a gallium nitride compound semiconductor layer for forming a luminous part on a substrate comprising at least an n-type layer and a p-type layer, by organic metal compound vapor phase growth method;

(b) placing the gallium nitride compound semiconductor layer in a nitrogen gas atmosphere after laminating, lowering an ambient temperature to a temperature for growing a GaAs compound in vapor phase and annealing the p-type layer of the gallium nitride compound semiconductor layer;

(c) forming a film of at least one type selected from a group consisting of GaAs, GaP, InAs, InP, all doped with Mg, and part of these group III elements replaced by Al on a surface of the gallium nitride compound semiconductor layer, as a protective layer in the nitrogen atmosphere; and

(d) annealing the p-type layer of gallium nitride compound semiconductor layer while simultaneously forming the protective film, lowering to room temperature after annealing, and removing the protective film by etching.

5,814,534

METHOD OF DOPING WITH BERRYLIUM AND METHOD OF FABRICATING SEMICONDUCTOR OPTICAL ELEMENT DOPED WITH BERYLLIUM

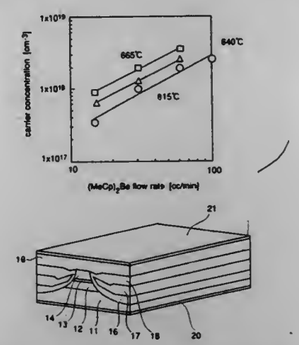
Tatsuya Kimura, and Takao Ishida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1995, Ser. No. 510,695

Claims priority, application Japan, Aug. 5, 1994, 6-184734

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—46 **8 Claims**



1. A method of doping a III-V compound semiconductor crystal with beryllium during epitaxial growth of the III-V compound semiconductor comprising employing $(CH_3C_5H_4)_2Be$ as a source of beryllium.

5,814,535

SUPPORTING MEMBER FOR COOLING MEANS, ELECTRONIC PACKAGE AND METHOD OF MAKING SAME

Yuzo Shimada; Takayuki Suyama, and Yoshimasa Tanaka, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 423,455, Apr. 19, 1995. This application Dec. 15, 1995, Ser. No. 573,131

Claims priority, application Japan, Apr. 22, 1994, 6-83548; Jun. 20, 1994, 6-137581; Jul. 13, 1994, 6-161092; Jul. 22, 1994, 6-170628

Int. Cl.[6] H01L *21/00;21/70;23/34*

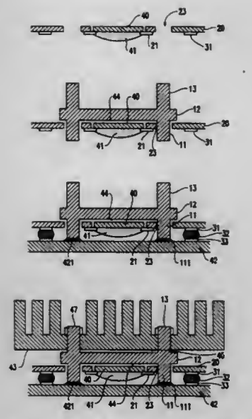
U.S. Cl. 438—122 **6 Claims**

1. A process of assembling an electronic package, comprising steps of:

(a) preparing a supporting member, said supporting member including a plate and a bottom leg, said plate having first and second surfaces, said bottom leg having first and second ends, said first end of said bottom leg being joined to said second surface of said plate;

(b) preparing a carrier having a hole;

(c) connecting an electronic device to said carrier;



(d) attaching said electronic device to said second surface of said plate, said second end of said bottom leg being inserted into said hole of said

(e) joining said second end of said bottom leg to a substrate; and

(f) attaching cooling means onto said first surface of said plate.

5,814,536

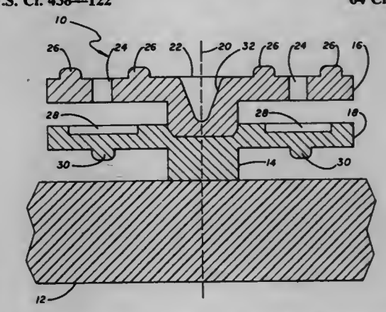
METHOD OF MANUFACTURING POWDERED METAL HEAT SINKS HAVING INCREASED SURFACE AREA

Michael D. Rostoker, Boulder Creek, and Mark Schneider, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 27, 1995, Ser. No. 578,966

Int. Cl.[6] H01L *21/48*

U.S. Cl. 438—122 **64 Claims**



1. A method of manufacturing a heat sink for a semiconductor device, the method comprising the steps of:

(a) selecting preliminary dimensions for a heat sink, the preliminary dimensions corresponding to a preliminary total surface area of the heat sink;

(b) adding a bump or an indentation to the preliminary dimensions to provide modified dimensions for the heat sink, the modified dimensions corresponding to a modified total surface area of the heat sink which is greater than the preliminary total surface area;

(c) forming the heat sink from a powdered metal, the heat sink being sized to the modified dimensions, wherein the heat sink includes a top surface and a bottom surface; and

(d) removing a portion of the heat sink between the top and bottom surfaces of the heat sink to provide a channel spanning between the top and bottom surfaces.

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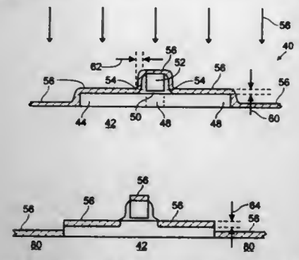
5,814,537

METHOD OF FORMING TRANSISTOR ELECTRODES FROM DIRECTIONALLY DEPOSITED SILICIDE

Jer-shen Maa, Vancouver, and Sheng Teng Hsu, Camas, both of Wash., assignors to Sharp Microelectronics Technology, Inc., Camas, Wash., and Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1996, Ser. No. 768,647
Int. Cl.[6] H01L *21/336;21/285*
U.S. Cl. 438—151 14 Claims



1. A method of forming a MOS transistor overlying a substrate of insulating material on an IC comprising the steps of:

a) forming source and drain electrodes of silicon overlying the substrate, forming a gate electrode with insulating sidewalls between the source and drain electrodes, and forming insulation material underneath the gate electrode, whereby the insulation electrically isolates the gate electrode from the source and drain electrodes;

b) depositing metal-silicide in a collimated path, with the path generally extending perpendicular to the source, drain, and gate electrodes, and parallel to the gate sidewalls, the silicide being selectively applied to the transistor to form a layer of silicide having a first thickness overlying the electrodes and a second thickness, less than the first thickness, overlying the gate sidewall insulation material; and

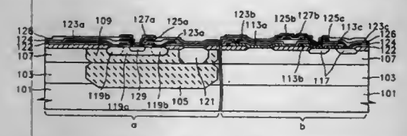
c) isotropically etching the silicide layer deposited in step b) a predetermined thickness, greater than the second thickness but less than the first thickness, to remove the layer of silicide overlying the gate sidewall insulation material, and leaving the electrodes covered with a layer of silicide having a third thickness, whereby the selective formation of silicide on the electrode surfaces increases electrode conductivity.

5,814,538

METHODS OF FORMING BICMOS DEVICES HAVING DUAL-LAYER EMITTER ELECTRODES AND THIN-FILM TRANSISTORS THEREIN

Young-ok Kim, and Jong-mil Youn, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Mar. 19, 1997, Ser. No. 820,979
Claims priority, application Rep. of Korea, Mar. 19, 1996, 96-7375
Int. Cl.[6] H01L *21/265*
U.S. Cl. 438—153 14 Claims



1. A method of forming a BiCMOS semiconductor device, comprising the steps of:

forming base and collector regions of a bipolar junction transistor in a semiconductor substrate;

forming an insulated-gate field effect transistor having source and drain regions in the semiconductor substrate;

forming a first emitter electrode of first conductivity type in contact with the base region while simultaneously forming a first gate electrode of a first thin-film transistor adjacent the insulated-gate field effect transistor;

forming an electrically insulating layer on the first emitter electrode and first gate electrode;

patterning the electrically insulating layer to expose a portion of the first emitter electrode; and

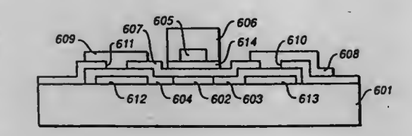
forming a second emitter electrode of first conductivity type on the exposed portion of the first emitter electrode while simultaneously forming a first active region of the first thin-film transistor on the electrically insulating layer so that the first active region extends opposite the first gate electrode.

5,814,539

METHOD OF MANUFACTURING AN ACTIVE MATRIX PANEL

Takashi Nakazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 439,180, May 9, 1995, Pat. No. 5,561,075, which is a division of Ser. No. 378,906, Jan. 26, 1995, Pat. No. 5,583,366, which is a continuation of Ser. No. 880,120, May 7, 1992, abandoned. This application Jul. 10, 1996, Ser. No. 678,029
Claims priority, application Japan, May 8, 1991, 3-102668; Oct. 17, 1991, 3-269675
Int. Cl.[6] H01L *21/786*
U.S. Cl. 438—163 24 Claims



1. A method of manufacturing an active matrix panel in which data signals are supplied to liquid crystal layers through a plurality of thin film transistors arranged in a matrix of pixels, gate lines and data lines being coupled to each thin film transistor, said method comprising the steps of:

forming a semiconductor layer on a substrate;

forming a gate insulating film on said semiconductor layer;

forming a gate electrode on said gate insulating film and a gate line in electrical contact with said gate electrode;

simultaneously creating an overlying gate insulator on a top and sidewalls of said gate electrode and said gate line by anodic oxidation of said sate electrode and said gate line;

forming a source region and a drain region in said semiconductor layer by adding impurities thereto as donors or acceptors using said overlying gate insulator as a self alignment mask wherein said source region and said drain region each have a lateral offset, ΔL from the sidewalls of said gate electrode; and

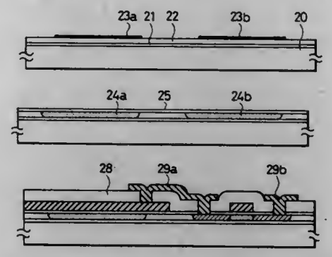
forming a data line in electrical contact with said source region and crossing over said gate line at a cross-over location, wherein said overlying gate insulator is located between said data line and said gate line at said cross-over location to insulate said data line from said gate line.

5,814,540

METHOD FOR PRODUCING A TRANSISTOR

Yasuhiko Takemura, and Toru Takayama, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 462,740, Jun. 5, 1995, abandoned, which is a division of Ser. No. 205,111, Mar. 3, 1994, abandoned. This application Jan. 17, 1997, Ser. No. 785,485
Claims priority, application Japan, Mar. 5, 1993, 5-071105
Int. Cl.[6] H01L *21/84*
U.S. Cl. 438—166 5 Claims



1. A method for producing a semiconductor device comprising the steps of:

forming a base film on a substrate;

forming a semiconductor film comprising silicon on the base film;

selectively forming a material comprising at least one element selected from the group consisting of nickel, iron, cobalt and platinum in contact with the semiconductor film; and

annealing the semiconductor film by heating in a reducing atmosphere to crystallize it using the element after said selectively forming step;

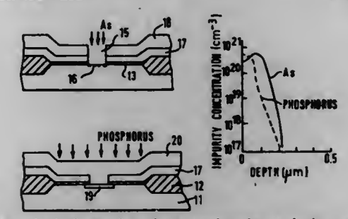
wherein a portion of the semiconductor film is not crystallized by the annealing step and insulates from crystallized portions of the semiconductor film each other.

5,814,541

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Hideki Shibata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 194,644, Feb. 10, 1994, abandoned, which is a continuation of Ser. No. 49,670, Apr. 21, 1993, abandoned, which is a continuation of Ser. No. 887,382, May 21, 1992, abandoned, which is a continuation of Ser. No. 683,081, Apr. 9, 1991, abandoned, which is a continuation of Ser. No. 279,621, Dec. 5, 1988, abandoned. This application Apr. 18, 1995, Ser. No. 425,234
Claims priority, application Japan, Dec. 4, 1987, 62-307010
Int. Cl.[6] H01L *21/225*
U.S. Cl. 438—232 3 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

providing a silicon substrate having an active area located at a surface of the substrate;

patterning an insulating film on the surface of the substrate;

depositing a first polysilicon layer on the insulating film;

forming a patterned photoresist on the first polysilicon layer;

anisotropically etching at least the first polysilicon layer and the insulating film while using the patterned photoresist as a mask to define a passage above the active area that exposes the active area of the silicon substrate;

passing arsenic through the passage and implanting the arsenic into the active area of the silicon substrate;

removing the photoresist;

depositing a first portion of a second polysilicon layer on the first polysilicon layer;

depositing a second portion of the second polysilicon layer in the passage to cover the active area of the silicon substrate;

diffusing phosphorus through the second portion of the second polysilicon layer and into the active area of the silicon substrate while the active area remains covered by the second portion of the second polysilicon layer; and

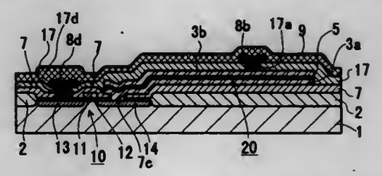
patterning the second polysilicon layer to form a wiring layer.

5,814,542

FABRICATION METHOD OF SEMICONDUCTOR DEVICE WITH MOSFET AND CAPACITOR HAVING LOWER AND UPPER POLYSILICON

Chika Nakajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 9, 1997, Ser. No. 781,811
Claims priority, application Japan, Jan. 9, 1996, 8-001145
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 438—250 9 Claims



1. A fabrication method of a semiconductor device with a MOSFET and a capacitor, comprising the steps of:

(a) preparing a semiconductor substructure;

(b) selectively forming an isolation insulating layer on a main surface of said substructure, thereby defining an active region for said MOSFET where said main surface is exposed from said isolation insulating layer;

(c) forming a gate insulating layer of said MOSFET on said exposed surface of said substructure in said active region;

(d) forming a polysilicon layer on said isolation insulating layer and said gate insulating layer;

(e) implanting dopant atoms into said polysilicon layer so that a peak depth of a distribution of said implanted dopant atoms is located at approximately a middle level of said polysilicon layer;

(f) performing a heat-treatment to said implanted polysilicon layer, thereby forming a dielectric region at approximately the middle level of said polysilicon layer due to reaction of said implanted dopant atoms with silicon atoms existing in said polysilicon layer;

remaining lower and upper parts of said polysilicon layer forming lower and upper polysilicon regions, respectively;

(g) patterning said implanted and heat-treated polysilicon layer to have a shape of said capacitor and a shape of a gate electrode of said MOSFET;

said capacitor being located on said isolation insulating layer, and said gate electrode being located on said gate insulating layer;

said gate electrode being formed by said remaining lower polysilicon region;

(h) selectively ion-implanting into said substructure through said gate insulating layer to thereby form a pair of source/drain regions at each side of said gate electrode in said active region;

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(i) forming an interlayer insulating layer on said patterned polysilicon layer, said gate insulating layer, and said isolation insulating layer over said entire substructure;

(j) patterning said interlayer insulating layer and said gate insulating layer to have first, second, third and fourth contact holes;

said first contact hole extending to said lower polysilicon region;

said second contact hole extending to said upper polysilicon region;

said third and fourth contact holes extending to said pair of source/drain regions, respectively;

(k) forming a conductive layer on said patterned interlayer insulating layer;

said conductive layer being contacted with said lower and upper polysilicon regions through said first and second contact holes, and with said pair of source/drain regions through said third and fourth contact holes, respectively; and

(l) pattering said conductive layer to have a shape;

wherein said dielectric region serves as a dielectric of said capacitor, and said lower and upper polysilicon regions serve as lower and upper electrodes of said capacitor, respectively.

5,814,543

METHOD OF MANUFACTURING A SEMICONDUTOR INTEGRATED CIRCUIT DEVICE HAVING NONVOLATILE MEMORY CELLS

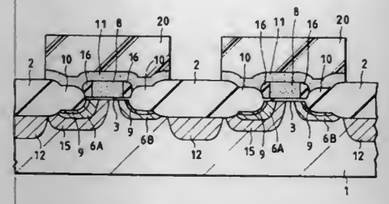
Toshiaki Nishimoto, Tachikawa; Shoji Shukuri, Koganei; Tsutomu Okazaki, Ome; Hideo Tobe, Kokubunji; Kazuhiro Komori, Musashimurayama; Masataka Kato, Koganei, and Hitoshi Kume, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1995, Ser. No. 562,021

Claims priority, application Japan, Nov. 22, 1994, 6-287813; Jun. 15, 1995, 7-148467

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 438—264 **19 Claims**



1. A method of manufacturing a semiconductor integrated circuit device, comprising steps of:

(a) providing (i) a semiconductor substrate having an active region and (ii) a first insulating film on the substrate, wherein said active region is defined by said first insulating film;

(b) forming a first silicon film over said active region with a first gate insulating film intervening therebetween, said first silicon film having an impurity concentration of 1×10^{19} atoms/cm^3 or lower and having a first length in a first direction over said active region, such that, in said first direction, parallel to a principal surface of the substrate, both edge portions of said first silicon film are formed over said active region;

(c) after said step (b), performing thermal-oxidation to form thermal-oxidation insulating films on said active region such that said thermal-oxidation insulating films are formed, in said first direction, adjacent to said edge portions of said first silicon film, wherein said thermal-oxidation insulating films each have a film thickness thicker than that of said first gate insulating film and thinner than that of sid first insulating film;

(d) after said step (c), forming a second silicon film on said first silicon film to contact said first silicon film,

said second silicon film having an impurity concentration higher than that of said first silicon film; and

(e) after said step (d), forming a conductive film over said second silicon film with a second gate insulating film intervening therebetween.

5,814,544

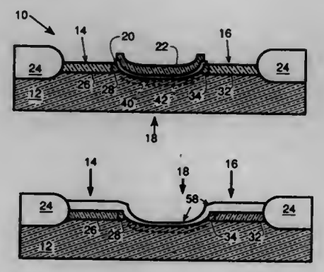
FORMING A MOS TRANSISTOR WITH A RECESSED CHANNEL

Tiao-Yuan Huang, Cupertino, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 489,772, Jun. 13, 1995, abandoned, which is a continuation of Ser. No. 275,207, Jul. 14, 1994, abandoned. This application Jul. 25, 1996, Ser. No. 687,294

Int. Cl.[6] H01L *21/265*

U.S. Cl. 438—291 **7 Claims**



1. A method of forming a MOS transistor having a substrate including a channel region, a relatively lightly doped source, a relatively heavily doped source spaced from said channel region by said relatively lightly doped source, a relatively lightly doped drain, and a relatively heavily doped drain spaced from said channel region by said relatively lightly doped drain, said method comprising the steps of:

forming a mask oxide layer on a silicon substrate;

depositing a mask nitride layer on said mask oxide layer;

etching said mask oxide layer and said mask nitride layer so as to expose said channel region of said substrate;

growing a shadow oxide at said channel region;

removing said nitride layer and said oxide layer so as to leave said shadow oxide over said channel region;

implanting source/drain dopant into source/drain regions of said substrate with said shadow oxide masking said channel region so as to define said relatively lightly doped source and said relatively lightly doped drain adjacent said channel region and said relatively heavily doped source and said relatively doped drain respectively spaced from said channel region by said relatively lightly doped source and said relatively lightly doped drain;

removing said shadow oxide so as to define a channel recess;

growing in a wet ambient a differential oxide more quickly on said source/drain regions than on said channel region so that it is thicker over said source/drain regions than over said channel region;

implanting channel dopant through said differential oxide into said channel region while said differential oxide masks said source/drain regions; and

forming a polysilicon gate over said channel region.

5,814,545

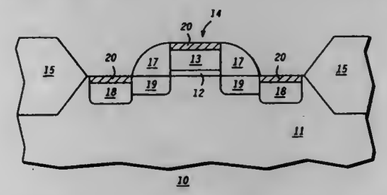
SEMICONDUCTOR DEVICE HAVING A PHOSPHORUS DOPED PECVD FILM AND A METHOD OF MANUFACTURE

Kenneth M. Seddon; Gregory W. Grynkewich, both of Gilbert; Vida Ilderem, Phoenix; Heidi L. Denton, Scottsdale, and Jeffrey Pearse, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 537,378, Oct. 2, 1995, abandoned. This application Mar. 4, 1997, Ser. No. 810,037

Int. Cl.[6] H01L *21/225;21/336*

U.S. Cl. 438—303 **10 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

providing a semiconductor substrate of a first conductivity and having a surface;

growing a layer of silicon dioxide on the semiconductor substrate;

depositing a layer of polysilicon on the semiconductor substrate;

patterning the layer of silicon dioxide and the layer of polysilicon to form a gate structure that extends above the surface of the semiconductor substrate;

depositing a dielectric layer overlying the gate structure and the semiconductor substrate, wherein the dielectric layer is formed by a plasma enhanced chemical vapor deposition process and the dielectric layer is doped with trimethylphosphite as the dielectric layer is deposited;

etching the dielectric layer with a reactive ion etch process thereby forming sidewall spacers adjacent to the gate structure;

annealing the semiconductor substrate thereby driving phosphorus from the dielectric layer and forming doped regions under the sidewall spacers; and

forming a source region and a drain region in the semiconductor substrate.

5,814,546

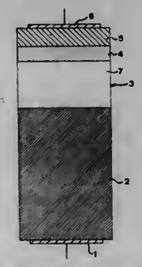
METHOD FOR PRODUCING A BIPOLAR SEMICONDUCTOR DEVICE HAVING SIC-BASED EPITAXIAL LAYER

Willy Hermansson, Västerås, Sweden, assignor to ABB Research Ltd., Zurich, Switzerland

Filed Nov. 1, 1996, Ser. No. 742,937

Int. Cl.[6] H01L *21/8222*

U.S. Cl. 438—309 **18 Claims**



1. A method for producing a bipolar semiconductor device having a first layer doped with a first doping type being one of n and p, said first layer being adapted to have minority charge carriers injected thereinto from a second layer of the device with a doping type opposite to that of the first layer in a forward conducting state of the device, said method comprising the steps of a) epitaxially growing said first layer and b) providing at least one region of said first layer with said minority charge carriers having a lifetime lower than in other parts of said first layer, said lower lifetime region of said first layer being formed directly during the epitaxial growth of this region by changing composition of substances fed to said first layer for the growth thereof when said region is grown.

5,814,547

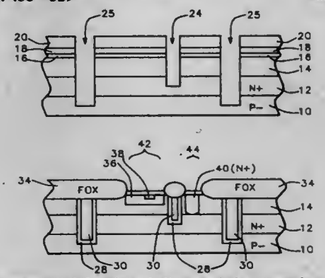
FORMING DIFFERENT DEPTH TRENCHES SIMULTANEOUSLY BY MICROLOADING EFFECT

Kuan-Lun Chang, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Filed Oct. 6, 1997, Ser. No. 944,573

Int. Cl.[6] H01L *21/8222*

U.S. Cl. 438—329 **20 Claims**



1. A method of forming shallow and deep trenches simultaneously in the fabrication of an integrated circuit comprising:

providing a pad oxide layer over a semiconductor substrate;

depositing a silicon nitride layer overlying said pad oxide layer;

depositing a silicon dioxide layer overlying said silicon nitride layer;

forming a photoresist mask over said silicon dioxide layer wherein said photoresist mask has a first opening having a first width and a second opening having a second width and wherein said second width is larger than said first width;

etching trench openings through said silicon dioxide, silicon nitride, and pad oxide layers to said underlying semiconductor substrate within said first and second openings;

removing said photoresist mask; and

thereafter etching into said substrate through said trench openings to form first and second trenches wherein said first trench within said first opening having said first width is a shallow trench having a first depth and wherein said second trench within said second opening having said second width is a deep trench having a second depth greater than said first depth completing said forming of said shallow and deep trenches simultaneously in the fabrication of said integrated circuit.

5,814,548

PROCESS FOR MAKING N-CHANNEL OR P-CHANNEL PERMEABLE BASE TRANSISTOR WITH A PLURALITY LAYERS

Jürgen Gräber, Jülich, Germany, assignor to Forschungszentrum Julich GmbH, Julich, Germany

Continuation of Ser. No. 616,663, Mar. 18, 1996, abandoned, which is a division of Ser. No. 256,600, Jul. 23, 1994, Pat. No. 5,541,424. This application Aug. 19, 1997, Ser. No. 914,496

Claims priority, application Germany, Dec. 23, 1991, 4142595.2; Dec. 23, 1991, 4142654.1

Int. Cl.[6] H01L *21/331*

U.S. Cl. 438—347 **26 Claims**

1. A process for producing an electronic component with a plurality of layers fabricated in a laminated composite, comprising

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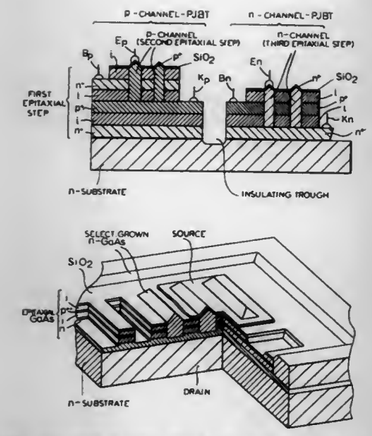


laterally structuring at least one of said layers having a p or n conductivity characteristic by forming said one of said layers in a sieve shape with a multiplicity of openings therein on a second layer of a different p or n conductivity characteristic than that of said one of said layers so that a space charge zone is formed in said second of said layers at boundaries of said one of said layers along said openings in said one of said layers.

5,814,549

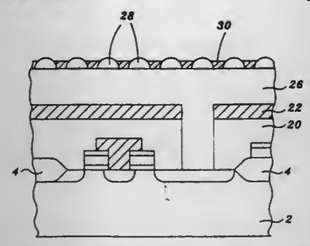
METHOD OF MAKING POROUS-SI CAPACITOR DRAM CELL

Shye-Lin Wu, Hsinchu, Taiwan, assignor to Powerchip Semiconductor Corp., Hsinchu, Taiwan

Filed Nov. 18, 1996, Ser. No. 746,858

Int. Cl.[6] H01L *21/20*

U.S. Cl. 438—398 **33 Claims**



1. A method for manufacturing a porous-Si capacitor on a semiconductor substrate, said substrate having transistors formed in said semiconductor substrate, the method comprising the steps of:

forming a first dielectric layer on said semiconductor substrate;

forming a second dielectric layer on said first dielectric layer;

etching said first dielectric layer and said second dielectric layer to define a contact hole therein;

forming a first polysilicon layer on said second dielectric layer and in said contact hole;

forming a HSG-Si layer on said first polysilicon layer;

etching said HSG-Si layer to form separated HSG-Si islands;

forming a SOG layer on said HSG-Si and said first polysilicon layer;

performing a thermal curing treatment to reflow said SOG layer;

etching said SOG layer to expose the top of said HSG-Si islands leaving a residual SOG layer on said first polysilicon layer;

using said residual SOG layer as a mask to etch a portion of said polysilicon layer and said HSG-Si islands to form a plurality of cavities in said first polysilicon layer, said HSG-Si islands being completely removed by said etch;

removing said residual SOG layer to define a porous-Si structure;

patterning a photoresist on said porous-Si structure;

etching said porous-Si structure to the surface of said second dielectric layer;

forming a dielectric film on the surface of said porous-Si structure and said second dielectric layer; and

forming a second polysilicon layer over said dielectric film to form a porous-Si capacitor.

5,814,550

COLLOIDAL SILICA FILMS FOR CELL CULTURE

Christine C. Wolcott, Horseheads, N.Y., assignor to Corning Incorporated

Filed Sep. 26, 1996, Ser. No. 721,152

Int. Cl.[6] C12M *3/04*

U.S. Cl. 435—402 **22 Claims**

1. An apparatus for growing cells in culture comprising a substrate at least a portion of which is coated with a colloidal silica film.

5,814,551

METHODS FOR FORMING INTEGRATED CIRCUIT ISOLATION LAYERS USING OXYGEN DIFFUSING LAYERS

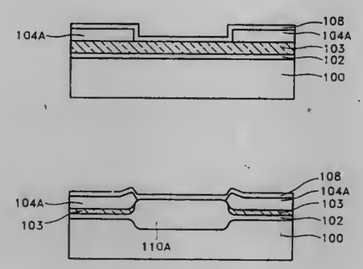
Chan-sik Park; Kyung-hwan Cho; Sung-han Lee, and Jae-kyung Lee, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 19, 1996, Ser. No. 751,992

Claims priority, application Rep. of Korea, Dec. 15, 1995, 1995-50695

Int. Cl.[6] H01L *21/76*

U.S. Cl. 438—448 **26 Claims**



1. A method for forming an integrated circuit isolation layer, said method comprising the steps of:

forming a patterned masking layer on a semiconductor substrate defining an exposed portion of said semiconductor substrate;

forming an oxygen diffusing layer on said exposed portion of said semiconductor substrate; and

forming an isolation layer on said exposed portion of said substrate;

wherein said semiconductor substrate includes a polysilicon layer adjacent said patterned masking layer and said oxygen diffusing layer so that said step of forming said isolation layer comprises oxidizing said polysilicon layer through said oxygen diffusing layer.

5,814,552

HIGH STEP PROCESS FOR MANUFACTURING ALIGNMENT MARKS FOR TWIN-WELL INTEGRATED CIRCUIT DEVICES

Bing-Yau Lu, Chungho, Taiwan, assignor to Holtek Microelectronics, Inc., Hsinchu, Taiwan

Filed Nov. 1, 1996, Ser. No. 741,630

Claims priority, application Taiwan, Sep. 26, 1996, 85111802

Int. Cl.[6] H01L *27/00;27/265*

U.S. Cl. 438—584 **8 Claims**

1. A method of fabricating high step alignment marks on a twin-well integrated circuit, said method comprising the steps of:

(a) forming a pad oxide layer and a nitride layer on a P-type silicon substrate;

(b) forming an alignment mark photoresist pattern overlaying said nitride layer using lithography technique;

(c) partially etching said nitride layer to form a nitride alignment pattern using said alignment mark photoresist pattern as a mask;

(d) forming an N-well photoresist pattern using lithography technique;

(e) ion implanting N-type impurities through said pad oxide layer into said P-type silicon substrate to form an N-doped region;

(f) removing said N-well photoresist pattern;

(g) forming a P-well photoresist pattern using lithography technique;

(h) ion implanting P-type impurities through said pad oxide layer into said P-type silicon substrate to form a P-doped region;

(i) removing said P-well photoresist pattern;

(j) thermally driving in so as to activate said N-doped and P-doped impurities to form N-well and P-well regions, respectively; and simultaneously causing the pad oxide layer overlaying said N-well and P-well regions and the region not covered by said nitride alignment pattern to become thermal oxide layer;

(k) removing said thermal oxide layer to reveal a recessed portion on the surface of said P-type silicon substrate, whereby the thickness of said nitride layer plus the depth of said recessed portion causes high step alignment marks to be formed.

5,814,553

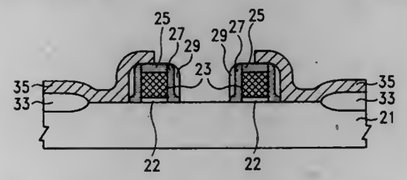
METHOD OF FABRICATING SELF-ALIGN CONTACT WINDOW WITH SILICON NITRIDE SIDE WALL

Andy Chuang, Taipei, and Tzong-Shien Wu, Hsinchu, both of Taiwan, assignors to United Micorelectronics Corp., Hsinchu, Taiwan

Filed May 9, 1996, Ser. No. 647,410

Int. Cl.[6] H01L *21/3205*

U.S. Cl. 438—595 **10 Claims**



1. A method of fabricating a self-align contact window, the method comprising the steps of:

forming a polysilicon layer over a semiconductor substrate;

forming a first silicon nitride layer on said polysilicon layer, wherein said first silicon nitride layer is used to form a cap layer;

patterning a first photoresist on said first silicon nitride layer and on said polysilicon layer;

etching said first silicon nitride layer and said polysilicon layer to form a gate electrode having said cap layer;

forming a second silicon nitride layer on said first silicon nitride layer, said polysilicon layer and said substrate;

forming a first silicon dioxide layer on said second silicon nitride layer;

etching resultant structure to form side-wall spacers of said electrode, said side-wall spacers consisting of said second silicon nitride layer formed on side walls of said gate electrode, and consisting of said first silicon dioxide layer on said second silicon nitride layer;

forming a second silicon dioxide layer on said side-wall spacers, said first silicon nitride layer, and said semiconductor substrate; said second silicon dioxide layer serving as an isolation layer for isolating said semiconductor substrate and subsequent overlying layers that are used as interconnections;

patterning a second photoresist on said second silicon dioxide layer; and

performing a plasma dry etching with highly selective etching to etch said second silicon dioxide layer to form a contact window, wherein said first, second silicon oxide layer having relatively high etching rate to said first, second silicon nitride layer under said plasma dry etching.

5,814,554

SEMICONDUCTOR DEVICE PROVIDED WITH A MICROCOMPONENT HAVING A FIXED AND A MOVABLE ELECTRODE

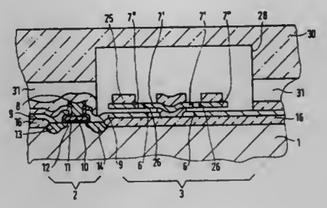
Mark A. De Samber, and Wilhelmus Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 21, 1995, Ser. No. 561,573

Claims priority, application European Pat. Off., Nov. 23, 1994, 94203409

Int. Cl.[6] H01L *21/44*

U.S. Cl. 438—611 **5 Claims**



1. A method of manufacturing a semiconductor device whereby semiconductor switching elements and an integrated microcomponent having a fixed electrode and an electrode which is movable relative to said fixed electrode are provided adjacent a surface of a semiconductor slice, after which the slice is subdivided into individual semiconductor devices, wherein, after the semiconductor switching elements have been provided, metal conductor tracks of a first level are provided on the surface which form the fixed electrode and electrical connections to at least one semiconductor switching element, over which an insulating layer and metal conductor tracks of a second level are provided which form the movable electrode and further electrical connections to at least one semiconductor switching element, after which the insulating layer between the fixed and the movable electrode is removed.

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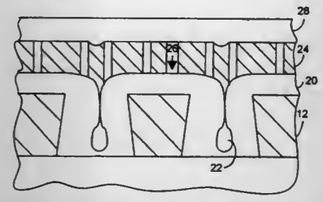
5,814,555

INTERLEVEL DIELECTRIC WITH AIR GAPS TO LESSEN CAPACITIVE COUPLING

Basab Bandyopadhyay; H. Jim Fulford, Jr.; Robert Dawson; Fred N. Hause; Mark W. Michael, and William S. Brennan, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 5, 1996, Ser. No. 658,456
Int. Cl.[6] H01L *21/316*
U.S. Cl. 438—619 **11 Claims**



1. A method for forming two levels of interconnect upon a semiconductor topography, comprising:

depositing a first layer of metal upon the semiconductor topography;

removing portions of said first layer of metal to form a spaced set of metal conductors having an undercut region at the periphery of each of said metal conductors adjacent said semiconductor topography;

depositing a first dielectric from a silane source upon said metal conductors to form an air gap at a midline between said metal conductors;

depositing a second dielectric upon said first dielectric;

removing portions of said second dielectric to form trenches at spaced intervals across said second dielectric; and

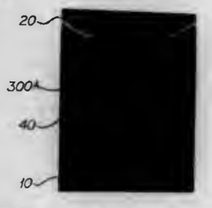
depositing a third dielectric a spaced distance above said trenches and upon said second dielectric between said trenches, and depositing a second layer of metal upon said third dielectric.

5,814,556

METHOD OF FILLING A CONTACT HOLE IN A SEMICONDUCTOR SUBSTRATE WITH A METAL

Young-jin Wee; In-seon Park, both of Seoul, and Sang-in Lee, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 15, 1996, Ser. No. 698,372
Claims priority, application Rep. of Korea, Aug. 18, 1995, 1995 25458
Int. Cl.[6] H01L *21/4763*
U.S. Cl. 438—620 **5 Claims**



1. A method of filling a contact hole in a semiconductor substrate, comprising:

(a) forming an interlayer insulation layer on the semiconductor substrate;

(b) forming a contact hole through the interlayer insulation layer and into the semiconductor substrate;

(c) depositing a diffusion prevention film on a bottom surface of the contact hole;

(d) depositing a continuous film of aluminum or aluminum alloy on the diffusion prevention film at a deposition temperature in a range between −25° C. and room temperature; and

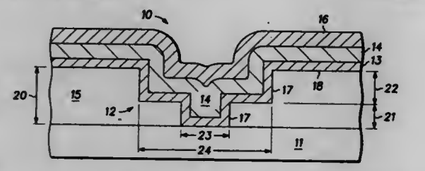
(e) heat-treating the film of the aluminum or aluminum alloy at a temperature less than or equal to the melting point of the film of the aluminum or aluminum alloy.

5,814,557

METHOD OF FORMING AN INTERCONNECT STRUCTURE

Ramnath Venkatraman; Elizabeth J. Weltzman, and Robert W. Fiordalice, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 20, 1996, Ser. No. 650,560
Int. Cl.[6] H01L *21/4763*
U.S. Cl. 438—622 **7 Claims**



1. A method of filling an interconnect structure, wherein the interconnect structure has sides, the method comprising the steps of:

providing the interconnect structure wherein the interconnect structure has a top opening having a first dimension and a bottom opening having a second dimension, the first dimension being greater than the second dimension:

forming a barrier layer on the sides of the interconnect structure, wherein the barrier layer is formed at a temperature below about 400° C.;

forming a first conductive layer overlying the barrier layer and in the interconnect structure, wherein the first conductive layer comprises aluminum and is formed at a temperature below about 400° C.;

forming a second conductive layer overlying the first conductive layer and in the interconnect structure, wherein the second conductive layer comprises aluminum and copper and is formed at a temperature below about 400° C.; and

annealing the second conductive layer at a temperature below about 400° C. so that copper from the second conductive layer is diffused into the first conductive layer, whereby none of the barrier layer, the first conductive layer, and the second conductive layer are ever exposed to a temperature greater than about 400° C. in the steps of forming and annealing:

polishing portions of all of the barrier layer, the first conductive layer, and the second conductive layer together to form a conductive interconnect structure which contains portions of all of the barrier layer, the first conductive layer, and the second conductive layer as part of the conductive interconnect structure.

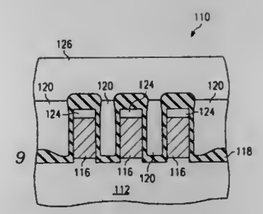
5,814,558

INTERCONNECT CAPACITANCE BETWEEN METAL LEADS

Shin-puu Jeng, Plano, and Robert H. Havemann, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 298,807, Aug. 31, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 658,401
Int. Cl.[6] H01L *21/441*
U.S. Cl. 438—623 **24 Claims**

1. A method for insulating metal leads on a semiconductor wafer, comprising the steps of:



depositing a metal layer on a substrate;

forming at least two metal leads in said metal layer, each metal lead having a top and at least two sides;

depositing an oxide liner on said metal leads and on exposed portions of said substrate, said oxide liner having a greater thickness on said tops of metal leads than on said sides of metal leads, wherein said oxide liner thickness on said tops of said leads is at least twice as thick as said oxide liner thickness on said sides of said metal leads;

depositing a low-dielectric constant material over said oxide liner at least between said metal leads, said low-dielectric constant material being a material with a dielectric constant of less than 3.5;

etching said low-dielectric constant material to expose said oxide liner on at least said tops of metal leads; and

depositing a second oxide over-layer over said low-dielectric constant material and said exposed oxide liner.

5,814,559

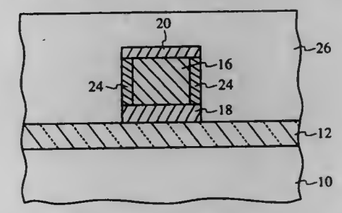
Patent Not Issued For This Number

5,814,560

METALLIZATION SIDEWALL PASSIVATION TECHNOLOGY FOR DEEP SUB-HALF MICROMETER IC APPLICATIONS

Robin W. Cheung, Cupertino; Simon S. Chan, Saratoga, and Subhash Gupta, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 29, 1995, Ser. No. 564,752
Int. Cl.[6] H01L *21/4763*
U.S. Cl. 438—648 **15 Claims**



1. A method for forming at least one metal interconnect structure which resists the formation of pile-ups caused by electromigration formed on an insulating layer formed over a semiconductor substrate, said method comprising the steps of:

(a) forming a first refractory metal layer on said insulating layer;

(b) forming a layer of aluminum on said first refractory metal layer;

(c) forming a second refractory metal layer on said layer of aluminum;

(d) patterning said second refractory metal layer, said layer of aluminum, and said first refractory layer thereby forming at least one aluminum interconnect sandwiched between said patterned first refractory metal layer and said patterned second refractory metal layer, each said aluminum interconnect having sidewalls comprising exposed aluminum; and

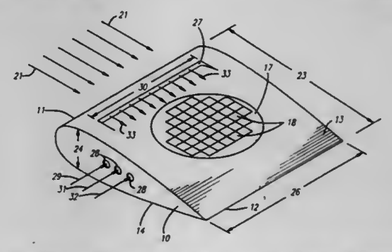
(e) forming a layer of aluminum intermetallic alloy comprising aluminum-refractory metal alloy on said sidewalls of said aluminum interconnects by reacting said exposed aluminum on said sidewalls with at least one refractory metal-containing precursor material, said layer of aluminum intermetallic alloy providing reinforcement for said sidewalls to enable said sidewalls to resist the formation of pile-ups caused by electromigration.

5,814,561

SUBSTRATE CARRIER HAVING A STREAMLINED SHAPED AND METHOD FOR THIN FILM FORMATION

Paul D. Jackson, 5014 E. Desert Park La., Paradise Valley, Ariz. 85253

Filed Feb. 14, 1997, Ser. No. 799,871
Int. Cl.[6] H01L *21/44*
U.S. Cl. 438—680 **23 Claims**



1. A method for forming a thin film on a substrate comprising the steps of:

placing a substrate onto a substrate holder within a reactor chamber, wherein the substrate holder has an airfoil profile;

introducing a gas into the reactor chamber to establish a boundary layer over the substrate; and

forming the thin film on the substrate.

17. A method for processing a substrate comprising the steps of:

placing the substrate onto a first major surface of a substrate carrier within a reaction chamber, wherein the first major surface has a leading edge and a trailing edge, and wherein at least a portion of the first major surface is curvilinear between the leading edge and the trailing edge;

introducing a gas into the reaction chamber to form a boundary layer over the substrate; and

exposing the substrate to a reactant species.

5,814,562

PROCESS FOR SEMICONDUCTOR DEVICE FABRICATION

Martin Laurence Green, Summit, N.J., and Yi Ma, Orlando, Fla., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 16, 1995, Ser. No. 558,997
Int. Cl.[6] H01L *21/302*
U.S. Cl. 438—708 **10 Claims**

1. A process for fabricating a device comprising:

cleaning a silicon substrate by two step process consisting essentially of 1.) contacting a silicon substrate with a gaseous mixture comprising anhydrous hydrofluoric acid, for a period of time that is sufficient to remove substantially all of the oxide from the surface of the silicon substrate; followed by 2.) contacting the silicon substrate with a stream of gaseous chlorine that has been subjected to broad band ultraviolet radiation with a wavelength in the range of about 200 nm to about 1100 nm wherein the substrate is maintained in an

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essentially oxygen free environment during steps 1.) and 2.) and the time therein between;

growing a layer of oxide over the surface of the cleaned silicon substrate; and

forming a semiconductor device on the silicon substrate.

5,814,563

METHOD FOR ETCHING DIELECTRIC USING FLUOROHYDROCARBON GAS, NH_3-GENERATING GAS, AND CARBON-OXYGEN GAS

Ji Ding, Campbell; Hongching Shan, San Jose, and Michael Welch, Livermore, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 639,388, Apr. 29, 1996. This application Jun. 12, 1996, Ser. No. 660,966

Int. Cl.[6] H01L *21/302*

U.S. Cl. 438—714 **13 Claims**

1. A method of selectively etching a substrate having a dielectric layer with resist thereon, the method comprising the steps of:

(a) placing the substrate in a process zone;

(b) introducing into the process zone, a process gas comprising (i) fluorohydrocarbon gas for forming fluorine-containing etchant species capable of etching the dielectric layer, (ii) NH_3-generating gas having a liquefaction temperature L_T in a range of temperatures ΔT of from about −60° C. to about 20° C., the volumetric flow ratio of fluorohydrocarbon gas to NH_3-generating gas being from about 2.5:1 to about 7:1, and (iii) carbon-oxygen gas, the volumetric flow ratio of carbon-oxygen gas to fluorohydrocarbon gas being from about 0.1:1 to about 1:1;

(c) maintaining the substrate at temperatures within about ±50° C. of the liquefaction temperature L_T; and

(d) forming a plasma from the process gas to etch the dielectric layer on the substrate at an etch rate of greater than 600 nm/minute, and an etching selectivity ratio for etching dielectric relative to underlying polysilicon of substantially ∞:1.

5,814,564

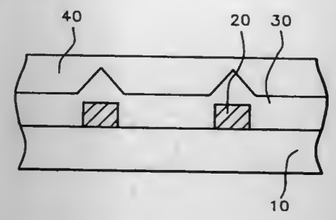
ETCH BACK METHOD TO PLANARIZE AN INTERLAYER HAVING A CRITICAL HDP-CVD DEPOSITION PROCESS

Liang-Gi Yao, Hsinchu; Ruey-Feng Rau, Mia-li; Tony Chang, Hsinchu, and Bu-Chin Chung, Taipei, all of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed May 15, 1997, Ser. No. 857,164

Int. Cl.[6] H01L *21/00*

U.S. Cl. 438—723 **11 Claims**



1. A method of fabrication of a planarized oxide layer over a semiconductor structure having raised portions; comprising the steps of:

a) forming spaced raised portions over a semiconductor structure;

b) forming a plasma chemical vapor deposition layer over said spaced raised portions;

c) forming a spin-on-glass layer over said plasma chemical vapor deposition oxide layer;

d) planarizing said spin-on-glass and said plasma chemical vapor deposition layer using an etch back process comprising six steps:

e) performing Step 1 at a CF_4 gas flow of between 88 and 108 sccm, a CHF_3 flow of between about 35 and 45 sccm, an argon flow of between about 40 and 60 sccm, at a pressure of between about 210 and 310 mtorr, at a power of about 0 watts, and for a time between about 5 and 25 seconds;

f) performing Step 2 at a CF_4 gas flow of between about 88 and 108 sccm, a CHF_3 flow of between about 35 and 45 sccm, an argon flow of between about 40 and 60 sccm, at a pressure of between about 210 and 310 mtorr, at a power of between 650 and 950 watts, and for a time between about 55 and 95 seconds;

g) performing Step 3 at a CF4 gas flow of between about 10 and 20 sccm, a CHF_3 flow of between about 70 and 90 sccm, an argon flow of between about 40 and 60 sccm, at a pressure between about 210 and 310 mtorr, and at a power of between 750 and 1050 watts, and for a time between about 70 and 110 seconds;

h) performing Step 4 at an Ar gas flow of between about 40 and 60 sccm, at a pressure between about 40 and 60 mtorr, at a power between 800 and 900 watts and for a time between 3 and 8 seconds;

i) performing Step 5 at an O_2 gas flow of between about 250 and 350 sccm, at a pressure of between 350 and 450 mtorr, at a power of between about 200 and 300 watts, and for a time between about 5 and 11 seconds; and

j) performing Step 6 at an O_2 gas flow of between about 250 and 350 sccm, at pressure between about 10 and 50 mtorr, at a power between about 90 and 110 watts, and for a time between about 4 and 8 seconds.

5,814,565

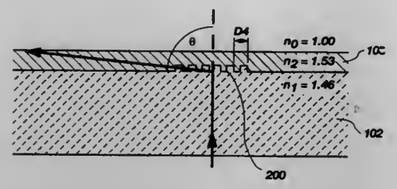
INTEGRATED OPTIC WAVEGUIDE IMMUNOSENSOR

W. Monty Reichert, Durham, N.C.; James N. Herron, Salt Lake City, Utah; Douglas A. Christensen, Salt Lake City, Utah, and Hsu-Kuo Wang, Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Filed Feb. 23, 1995, Ser. No. 393,450

Int. Cl.[6] G01N *33/53;21/17*

U.S. Cl. 422—82.11 **21 Claims**



1. A kit for performing specific binding assays, which kit includes:

a biosensor comprising:

a step gradient waveguide including a planar substrate formed of a first optical material of refractive index n_1, said planar substrate having a surface disposed adjacent to and in direct contact with a waveguide film formed of a second optical material having a refractive index n_2 which is greater than n_1; and

at least one specific binding molecule immobilized to said waveguide film and configured to bind, with specificity, an analyte.

5,814,566

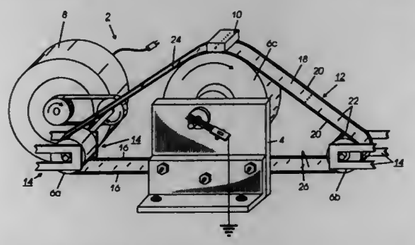
BELT ASSEMBLY

Edward L. Schlueter, Jr., Rochester; Lucille M. Sharf, Pittsford, and Kevin J. Teed, Webster's Crossing, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 6, 1997, Ser. No. 812,219

Int. Cl.[6] B32B *27/08;* **B65G** *15/34*

U.S. Cl. 442—88 **13 Claims**



1. A belt assembly comprising:

(a) an endless belt capable of repeated cycling over rollers having a center region between a first side region and a second side region, where the first side region includes a first side edge of the belt thickness and the second side region includes a second side edge of the belt thickness, wherein a fluoropolymer composition covers a portion of the length of the first side edge, wherein there is absent the fluoropolymer composition on the surface of the center region; and

(b) a belt guide apparatus which contacts the first side edge during cycling of the belt to position the belt on the rollers, wherein the fluoropolymer composition reduces the wear of the belt at the first side edge.

5,814,567

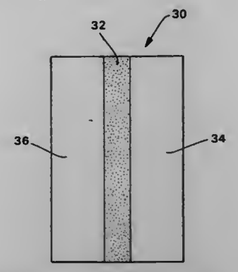
DURABLE HYDROPHILIC COATING FOR A POROUS HYDROPHOBIC SUBSTRATE

Ali Yahiaoui, Roswell; Xin Ning, Alpharetta; Charles Edward Bolian, II, Buford; Debra Jean McDowall, Roswell; David Charles Potts, Dunwoody, and Daniel Joseph VanHout, Roswell, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Jun. 14, 1996, Ser. No. 665,172

Int. Cl.[6] B32B *3/26*

U.S. Cl. 442—118 **15 Claims**



1. A coated porous substrate which comprises:

a porous hydrophobic polymer substrate which is substantially uniformly coated with a hydrophilic polymeric material in an amount of from about 0.1 to about 1.25 percent by weight, based on the dry weight of the substrate; in which

the hydrophilic polymeric material is a polysaccharide or a modified polysaccharide;

the coating of hydrophilic polymeric material is durable to an aqueous medium at a temperature in a range of from about 10° C. to about 50° C.; and

the coating of hydrophilic polymeric material will not significantly suppress the surface tension of an aqueous medium with which the coated porous substrate may come in contact.

5,814,568

WATER-ABSORBENT PAPER OF NONWOVEN FABIC FOR PREVENTING DISCOLORATION OF A LETTUCE STEM CUT SURFACE

Yoshitaka Kato, Yokohama, and Atsushi Hishiki, Omiya, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP95/01170, § 371 Date Dec. 16, 1996, § 102(e) Date Dec. 16, 1996, PCT Pub. No. WO96/00004, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 12, 1995, Ser. No. 750,562

Claims priority, application Japan, Jun. 27, 1994, 6-144561

Int. Cl.[6] D04H *1/58;* **C07D** *315/00;* **A01N** *3/00*

U.S. Cl. 442—123 **15 Claims**

1. A water-absorbent paper or nonwoven fabric containing 5-hydroxy-2-hydroxymethyl-γ-pyrone for preventing the discoloration of the cut surface of lettuce stem and further containing an organic acid having from 2 to 10 carbon atoms and/or a water-retaining agent.

5,814,569

UNIAXIALLY ELASTIC NONWOVEN FABRIC

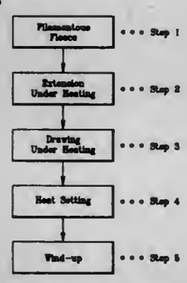
Migaku Suzuki; Hiroaki Fukui, both of Tokyo; Yoshihiko Mineda, Kyoto; Koichi Nagaoka, Kyoto, and Michiyo Iimi, Kyoto, all of Japan, assignors to Unitika Ltd., Hyogo, and Japan Absorbent Technology Institute, Tokyo, both of Japan

Filed Mar. 27, 1997, Ser. No. 828,037

Claims priority, application Japan, Mar. 27, 1996, 8-099342; Aug. 23, 1996, 8-241025

Int. Cl.[6] D06C *3/00*

U.S. Cl. 442—328 **7 Claims**



1. A uniaxially elastic nonwoven fabric comprising accumulated conjugate filaments each of which is about concentric sheath-core type being composed of a polyester core component and a polyolefine sheath component having lower melting point than that of said polyester core component, and heat bonded areas being interspersed by heat bonding said conjugate filaments one another by softening or melting said sheath component; wherein following expressions (1) to (4) are concurrently satisfied:

$$EC \geqq 150\% \quad (1)$$

$$EC/EM \geqq 5 \quad (2)$$

$$EEC(50) \geqq 60\% \quad (3)$$

$$EEC(100) \geqq 50\% \quad (4)$$

where: EC indicates a breaking elongation of said nonwoven fabric in cross direction, EM indicates a breaking elongation of said nonwoven fabric in machine direction, EEC(50) indicates a percentage of elastic recovery at the time of extending said nonwoven

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fabric by 50% in cross direction, and EEC(100) indicates a percentage of elastic recovery at the time of extending said nonwoven fabric by 100% in cross direction.

5,814,570

NONWOVEN BARRIER AND METHOD OF MAKING THE SAME

Bernard Cohen, Berkeley Lake, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 266,293, Jun. 27, 1994, abandoned. This application May 15, 1996, Ser. No. 648,451

Int. Cl.[6] B32B *5/06*

U.S. Cl. 442—346 **19 Claims**

1. An ethylene oxide sterilized web wherein at least one portion of the web has been subjected to electrostatic charging.

5,814,571

DIELECTRIC PASTE AND THICK-FILM CAPACITOR USING SAME

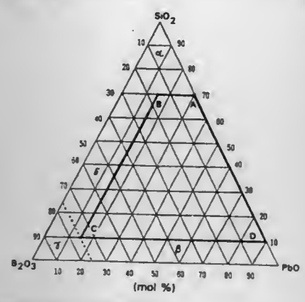
Hiromichi Kawakami, Moriyama, and Hiroji Tani, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 24, 1996, Ser. No. 638,951

Claims priority, application Japan, Apr. 28, 1995, 7-106187

Int. Cl.[6] C03C *8/16;8/14*

U.S. Cl. 501—20 **12 Claims**



1. A dielectric paste comprising:

an organic vehicle;

a powdered glass comprising a main component given by $xSiO_2$—yB_2O_3—zPbO in which x, y, and z are expressed in mole percent and lie within a region defined by connecting points A (x=70, y=0, and z=30), B (x= 70, y=15, and z=15), C (x=10, y=75, and z=15), and D (x=10, y=0, and z=90) on a ternary diagram; and

a powdered lead-based perovskite dielectric.

5,814,572

GLASSY SINTERED BODY

Kazuo Saiki, Toki; Masami Kato, Tajimi, and Kokichi Hanaoka, Ueda, all of Japan, assignors to Crystal Clay Corporation, Tokyo, Japan

Continuation of Ser. No. 699,194, Aug. 19, 1996, abandoned, which is a continuation of Ser. No. 433,429, May 8, 1995, abandoned. This application Oct. 10, 1997, Ser. No. 948,590

Int. Cl.[6] C03C *14/00;* **C04B** *14/12*

U.S. Cl. 501—32 **3 Claims**

1. A glassy sintered body consisting essentially of a sintered raw material,

wherein said raw material is a mixture made by adding 25–30 wt. % of bentonite, which includes 3 wt. % of water, to 70–75 wt. % of a powdery glass crushed into a powder form,

kneading said mixture of said powdery glass and said bentonite, and forming said kneaded raw material,

wherein said raw material is sintered at a temperature between 950° and 1000° C.

5,814,573

PRODUCTION OF SIALON

Christopher Stirling Hogg, Bodmin, England, assignor to ECC International Ltd., England

Filed Jan. 29, 1996, Ser. No. 593,641

Claims priority, application United Kingdom, Jan. 30, 1995, 9501745

Int. Cl.[6] C04B *35/58*

U.S. Cl. 501—98.1 **18 Claims**

1. A process for preparing β'-sialon, which process comprises heating a mixture of particles comprising from 70% to 90% by weight of particles of an aluminosilicate material and from 30% to 10% by weight of particles of a carbonaceous material at a temperature in the range of from 1300° C. to 1600° C. in nitrogen in a reaction vessel and causing said particles to be in substantially continuous motion relative to each other and relative to the nitrogen and wherein the residence time of the particles in the reaction vessel does not exceed three hours, and wherein the aluminosilicate material comprises a kandite clay which has been calcined at a temperature of from 450° C. to 1300° C. such that loss on ignition of the calcined clay at 1000° C. for 2 hours is not more than 1% by weight.

5,814,574

CATALYST COMPOSITIONS AND PROCESS FOR PREPARING POLYOLEFINS

John Paul McNally, Berkshire, United Kingdom, assignor to BP Chemicals Limited, United Kingdom

Continuation of Ser. No. 179,933, Jan. 11, 1994, abandoned. This application Aug. 5, 1996, Ser. No. 689,191

Claims priority, application United Kingdom, Jan. 19, 1993, 9300934

Int. Cl.[6] B01J *31/12*

U.S. Cl. 502—103 **15 Claims**

1. A catalyst composition for use in the polymerization of olefins comprising a metallocene complex of the general formula

$$M[X(R)_n]_xY_p \quad (I)$$

wherein M is zirconium, X is a cyclopentadienyl group, R is a radical having Lewis acid functionality selected from the group consisting of an alkoxyl alkyl radical, an heterocyclic oxygen radical or an alkyl heterocyclic oxygen radical, Y is chloride, n is 1 or 5, x is 2, and p is 2, bound to and supported on an inorganic support.

5,814,575

CHROMIUM COMPOUNDS AND USES THEREOF

William K. Reagen, Stillwater, Minn.; Ted M. Pettijohn, and Jeffrey W. Freeman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 290,048, Jul. 29, 1994, Pat. No. 5,523,507, which is a division of Ser. No. 109,858, Aug. 20, 1993, Pat. No. 5,376,612, which is a continuation of Ser. No. 807,292, Dec. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 698,639, May 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 454,554, Dec. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 392,688, Aug. 10, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 485,344

Int. Cl.[6] C08F *4/69*

U.S. Cl. 502—117 **27 Claims**

1. A process to prepare a catalyst consisting essentially of:

(a) recovering a chromium-containing compound from a mixture comprising about one mole of chromous chloride, about two moles of sodium pyrrole, and tetrahydrofuran;

(b) reacting the chromium-containing compound of (a) with an aromatic compound and an activating compound selected from the group consisting of metal alkyls and Lewis acids to form a reaction product;

(c) adding an inorganic oxide to the reaction product of (b); and

(d) recovering a solid product.

5,814,576

CATALYST FOR PURIFYING EXHAUST GAS AND METHOD OF PRODUCING SAME

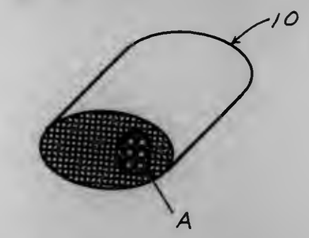
Shinji Yamamoto, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 25, 1996, Ser. No. 755,375

Claims priority, application Japan, Nov. 27, 1995, 7-307916

Int. Cl.[6] B01J *23/00;23/40;8/02*

U.S. Cl. 502—303 **10 Claims**



1. A catalyst for purifying exhaust gas, comprising:

a monolithic carrier; and

a catalyst component carrying layer formed on a surface of said monolithic carrier, said carrier component carrying layer including

a catalyst component including rhodium, and

a catalyst component substrate for carrying the catalyst component, said catalyst component substrate including a composite oxide containing zirconium oxide and at least one element selected from the group consisting of magnesium, calcium, strontium, barium, yttrium and lanthanum, said composite oxide having a composition represented by the following general formula:

$$X_aZr_bO_c$$

where X is at least one element selected from the group consisting of magnesium, calcium, strontium, barium, yttrium and lanthanum; and a, b, and c, indicate atomic ratios, in which a is within a range of from 0.01 to 0.6 on the basis of b being 1.0 and c is a number which satisfies the valence of elements of the formula $X_aZr_bO_c$.

5,814,577

CATALYST AND FABRICATION METHOD OF SAME FOR PURIFYING EXHAUST GASES OF AUTOMOBILE

Sang-cheol Park, and Chan-ho Pak, both of Seoul, Rep. of Korea, assignors to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

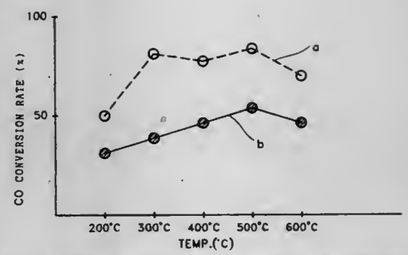
Filed Oct. 9, 1996, Ser. No. 728,121

Claims priority, application Rep. of Korea, Oct. 9, 1995, 95-34572

Int. Cl.[6] B01J *23/10*

U.S. Cl. 502—304 **16 Claims**

1. A catalyst comprising an oxygen absorbing material and a carrier impregnated with a noble metal, wherein said oxygen



absorbing material comprises a cobalt-cerium oxide compound.

5,814,578

Patent Not Issued For This Number

5,814,579

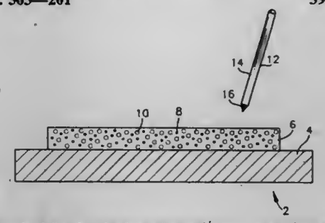
MULTICOLOR PRINTING SYSTEM

Mark D. Dotson, Dayton; William J. Castle, Hilliard, both of Ohio, and Bryan A. Netsch, Lewisville, Tex., assignors to The Standard Register Company, Dayton, Ohio

Filed Aug. 6, 1996, Ser. No. 689,221

Int. Cl.[6] B41M *5/132;5/165*

U.S. Cl. 503—201 **39 Claims**



1. A method for developing a latent image on a substrate which comprises providing a dispersion of organic dye particles having an average particle size of from about 2 to about 6 microns and organic developer particles having an average particle size of from about 2 to about 6 microns in an aqueous carrier fluid, printing the dispersion on a substrate so that a substantially invisible image is produced and contacting the printed substrate in the portion of the printed latent image with an imaging device containing an oxygenated solvent to dissolve the dye particles and developer particles and cause reaction therebetween in order to develop a visible image on the substrate.

5,814,580

THERMAL TRANSFER RECORDING MATERIAL

Akira Onishi; Noriyasu Kita; Noritaka Nakayama; Tatsuo Tanaka, and Tawara Komamura, all of Hino, Japan, assignors to Konica Corporation, Japan

Filed Feb. 28, 1996, Ser. No. 608,285

Claims priority, application Japan, Mar. 10, 1995, 7-051168; May 24, 1995, 7-125234

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **21 Claims**

8. A thermal transfer recording method comprising the steps of

(i) superposing a dye-providing material comprising a support having thereon an ink layer containing an azomethine dye, on an image receiving material comprising a support having thereon an image receiving layer containing a metal ion-containing compound so that the ink layer is in contact with the image receiving layer,

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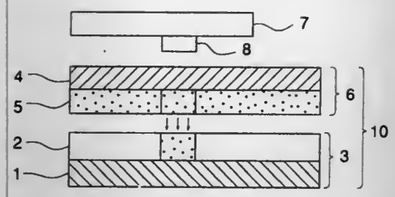
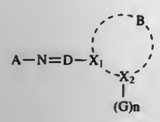


(ii) applying heat imagewise to the dye-providing material and

(iii) peeling the dye providing material from the image receiving material;

wherein said azomethine dye is represented by the following formula (1),



formula (1)

wherein A represents an aromatic hydrocarbon ring or heterocyclic ring; D represents a nitrogen-containing heterocyclic ring; B represents a non-metallic atom group necessary for forming an aromatic hydrocarbon ring or heterocyclic ring; X_1 and X_2 independently represent a carbon or nitrogen atom; and n is 1 when X_2 is a carbon atom and n is 0 when X_2 is a nitrogen atom; G represents a hydrogen atom, an amino group, hydroxy group, alkoxy group, acylamino group, alkylureido group, arylureido group, alkylsulfonamido group, arylsulfonamido group, alkylaminosulfonylamino group or arylaminosulfonylamino group.

5,814,581

PLANT GROWTH PROMOTER COMPRISING JASMONATE AND BRASSINOLIDE

Shin-ichi Hirakawa, Fujisawa; Yasuo Kamuro, Ichinomiya; Suguru Takatsuto, Joetsu; Tsuyoshi Watanabe, Atsugi, and Hiroki Kuriyama, Kanagawa, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/01693, § 371 Date Apr. 23, 1997, § 102(e) Date Apr. 23, 1997, PCT Pub. No. WO96/06529, PCT Pub. Date Jul. 3, 1996

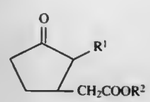
PCT Filed Aug. 25, 1995, Ser. No. 793,335

Claims priority, application Japan, Aug. 26, 1994, 6-225674

Int. Cl.[6] A01N *37/02;37/06;43/22*

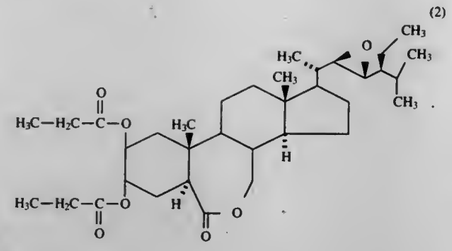
U.S. Cl. 504—140 **23 Claims**

1. A plant growth promoter comprising as the active ingredients (i) a jasmonic acid or jasmonate, represented by the following formula (1):



(1)

wherein R^1 is a pentyl or pentenyl group and R^2 is hydrogen or an alkyl group, and (ii) a brassinosteroid represented by the following formula (2):



5,814,582

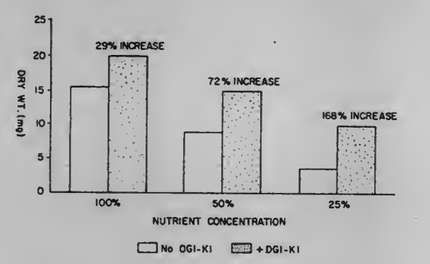
METHOD FOR ENHANCED PLANT PRODUCTIVITY

Larry P. Koskan, Orland Park; Abdul Rehman Y. Meah, Justice; Robert J. Ross, Elmhurst, and Lai-Duien Grace Fan, Lake Zurich, all of Ill., assignors to Donlar Corporation, Bedford Park, Ill.

Continuation-in-part of Ser. No. 313,436, Sep. 27, 1994, Pat. No. 5,593,947, which is a continuation-in-part of Ser. No. 972,375, Nov. 5, 1992, Pat. No. 5,350,735. This application Jan. 10, 1997, Ser. No. 781,651

Int. Cl.[6] A01N *37/06;37/08;37/10;37/18*

U.S. Cl. 504—320 **32 Claims**



1. A method for enhancing plant productivity which comprises supplying to a plant a productivity enhancing amount of a water-soluble co-polymer of a carboxylic acid and an amino acid having an acidic alkyl group, —RCOOH, in which R contains 1 to about 22 carbon atoms, wherein the amino acid residue constitutes at least about 20 mole percent of the co-polymer, the co-polymer having a molecular size larger than about 1,600 Daltons.

5,814,583

SUPERCONDUCTING THIN FILM AND A METHOD FOR PREPARING THE SAME

Hideo Itozaki; Saburo Tanaka; Nobuhiko Fujita; Shuji Yazu, and Tetsuji Jodai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 415,763, Apr. 3, 1995, abandoned, which is a continuation of Ser. No. 215,497, Jul. 6, 1988, abandoned. This application Jul. 1, 1996, Ser. No. 673,022

Claims priority, application Japan, Jul. 6, 1987, 62-168356; Jul. 6, 1987, 62-168357; Jul. 10, 1987, 62-172696; Jul. 10, 1987, 62-172697; Jul. 10, 1987, 62-172698; Jul. 17, 1987, 62-178600

Int. Cl.[6] H01L *39/00*

U.S. Cl. 505—237 **4 Claims**

1. A high-temperature superconducting thin film composed of compound oxide and deposited on a substrate of MgO or $SrTiO_3$,

wherein said compound oxide is a member selected from the group consisting of:

$Y_1Ba_2Cu_3O_{7-x}$, $Ho_1Ba_2Cu_3O_{7-x}$, $Lu_1Ba_2Cu_3O_{7-x}$, $Sm_1Ba_2Cu_3O_{7-x}$, $Nd_1Ba_2Cu_3O_{7-x}$, $Gd_1Ba_2Cu_3O_{7-x}$, $Eu_1Ba_2Cu_3O_{7-x}$, $Er_1Ba_2Cu_3O_{7-x}$, $Dy_1Ba_2Cu_3O_{7-x}$, $Tm_1Ba_2Cu_3O_{7-x}$, $Yb_1Ba_2Cu_3O_{7-x}$, $La_1Ba_2Cu_3O_{7-x}$, $(La, Sr)_2CuO_{4-x}$,

in which x is a number which satisfies a range of $0<x<1$, and wherein an outer surface of said high-temperature superconducting thin film is covered with a protective layer comprising a crystalline film which is composed of $SrTiO_3$.

5,814,584

COMPOUND IN THE SERIES A_2MESBO_6 FOR USE AS SUBSTRATES BARRIER-DIELECTRIC LAYERS AND PASSIVATING LAYERS IN HIGH CRITICAL TEMPERATURE SUPERCONDUCTING DEVICES

Arthur Tauber, Elberon; William D. Wilber, Neptune; Steven C. Tidrow, Eatontown; Robert D. Finnegan, West Long Branch, and Donald W. Eckart, Wall, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 30, 1995, Ser. No. 502,739

Int. Cl.[6] H01B *39/12*

U.S. Cl. 505—238 **2 Claims**

1. A thin film high T_c structure comprising thin films of a compound of the general formula A_2MeSbO_6 wherein A is barium or strontium and Me is a non-magnetic ion selected from the group consisting of scandium, indium and gallium interspersed with a layer of a copper oxide superconductor.

5,814,585

BI(PB)SRCACUO SUPERCONDUCTORS

Rodney Riddle, Dorset, Great Britain; Matthias Kuntz, Seeheim-Jugenheim, Germany; Bernd Müller, Zwingenberg, Germany; Dietmar Raulin, Einhausen, Germany, and Günther Feldmann-Schlobohm, Dieburg, Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Germany

Continuation of Ser. No. 439,781, May 12, 1995, Pat. No. 5,614,472. This application Nov. 26, 1996, Ser. No. 756,517

Claims priority, application United Kingdom, May 13, 1994, 9409660.9

Int. Cl.[6] H01L *39/12;* **B05D** *1/08;* **C04B** *35/505;35/45*

U.S. Cl. 505—782 **14 Claims**

1. A high temperature superconductor ceramic formed from multi-element metal oxide powders having the formula $Bi_xSr_xCa_y$-Cu_xO_z, where x=1.0–3.0, y=0.5–2.5 and z is not specified or the formula $Pb/Bi_xSr_xCa_xCu_xO_z$, where x=1.5–3.0, y=2.5–3.5 and z is not specified, prepared by a spray-pyrolytic process comprising the steps of mixing salts of the metals needed to form said powders in an aqueous solution; forming an aerosol of said aqueous solution; spraying said aerosol through an independently operated hydrogen/oxygen flame having a temperature of 800° C. to 1100° C.; and collecting said powders which form after said spraying; wherein said aerosol and said powder do not contact elemental carbon, carbon containing compounds or materials containing carbon.

5,814,586

POLAR GRAFTED POLYOLEFINS, METHODS FOR THEIR MANUFACTURE, AND LUBRICATING OIL COMPOSITIONS CONTAINING THEM

Frederick J. Boden, Somerset; Richard P. Sauer, North Plainfield; Irwin L. Goldblatt, Edison, and Michael E. McHenry, Washington, all of N.J., assignors to Castrol Limited, Swindon, England

Continuation of Ser. No. 327,508, Oct. 21, 1994, Pat. No. 5,523,008, which is a continuation-in-part of Ser. No. 541,832, Oct. 10, 1995, Pat. No. 5,663,126. This application May 7, 1996, Ser. No. 646,454

Int. Cl.[6] C10M *149/10;* **C08F** *279/02*

U.S. Cl. 508—221 **22 Claims**

1. A method of making a dispersant viscosity index improver, comprising the steps of:

A. providing a polyolefin having graftable unsaturation, an initiator, and a nitrogenous, ethylenically unsaturated, aliphatic or aromatic monomer having from 2 to about 50 carbon atoms;

B. dissolving said polyolefin in a solvent, forming a solution;

C. dispersing said monomer in said solution; and

D. adding said initiator to said solution at an average rate of addition of less than about 20% of the amount sufficient to graft said monomer to said polymer per minute of addition, said adding step being carried out at a temperature exceeding the initiation temperature of said initiator;

thereby forming a graft copolymer of said monomer on a polyolefin, said graft copolymer having an ADT value of at least about 8.

5,814,587

LUBRICATING OIL CONTAINING AN ADDITIVE COMPRISING THE REACTION PRODUCT OF MOLYBDENUM DITHIOCARBAMATE AND METAL DITHDROCARBYL DITHIOPHOSPHATE

Elisavet P. Vrahopoulou, Chatham; Richard S. Polizzotti, Milford; Daniel Paul Leta, Flemington, and Stephan D. Cameron, Milford, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 13, 1996, Ser. No. 766,828

Int. Cl.[6] C10M *159/12*

U.S. Cl. 508—363 **6 Claims**

1. A method for forming a lubricating composition having a reaction product comprising:

adding to a major amount of an oil of lubricating viscosity a minor amount of a metal dihydrocarbyl dithiophosphate and a molybdenum dithiocarbamate and

heating the admixture with an air sparge sufficient to saturate the admixture with air to a temperature ranging from above about 135° C. to about 200° C. thereby forming the lubricating composition having a reaction product.

5,814,588

AQUEOUS ALKALI CLEANING COMPOSITIONS

Francis R. Cala, Highland Park, and Richard A. Reynolds, Plainsboro, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Mar. 19, 1996, Ser. No. 617,606

Int. Cl.[6] C11D *1/722;3/10;3/37;3/28*

U.S. Cl. 510—175 **39 Claims**

1. An aqueous alkali cleaning composition comprising an alkali metal salt, an N-alkyl-pyrrolidone derivative surfactant comprising from about 0.1 to about 2.0 wt. % of the composition, and an ethylene oxide/propylene oxide block copolymer having a formula:

$$HO-(CH_2CH_2O)_x-(CH_2\overset{\overset{CH_3}{|}}{C}HO)_y-(CH_2CH_2O)_z-H$$

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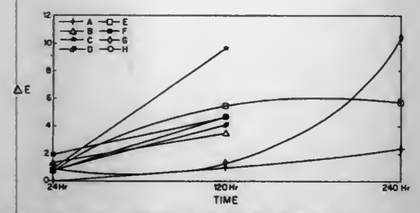


wherein x and y are integers such that the block copolymer has a molecular weight of from about 1500 to about 2500, said block copolymer comprises from about 5.0 to about 7.1 times the weight of the N-alkyl-pyrrolidone derivative in the cleaning composition.

5,814,589

Patent Not Issued For This Number

5,814,590

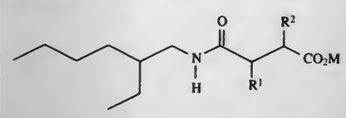
LOW STREAKING AND FILMING HARD SURFACE CLEANERS

Alan Edward Sherry; Daniel Stedman Connor, both of Cincinnati, Ohio, and Robert Emerson Stidham, Lawrenceburg, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 6, 1996, Ser. No. 595,904
Int. Cl.[6] C11D *1/28;1/04*
U.S. Cl. 510—237 **21 Claims**

1. A hard surface cleaning composition having improved shine and anti-streaking benefits comprising:

a) at least about 0.1% by weight, of a sulfosuccinamate having the formula



wherein R^1 and R^2 are hydrogen or $—SO_3M^2$ provided R^1 does not equal R^2; M and M^2 are independently hydrogen or a salt forming cation;

b) at least about 0.1% by weight, of a nonionic surfactant having the formula

$$CH_3(CH_2)_xCH_2O(CH_2CH_2O)_yH$$

wherein x is from about 6 to about 12, y is from about 3.5 to about 10; and

c) the balance carriers and adjunct ingredients.

5,814,591

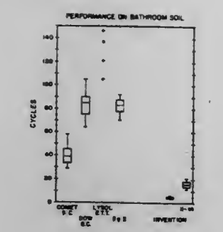
HARD SURFACE CLEANER WITH ENHANCED SOIL REMOVAL

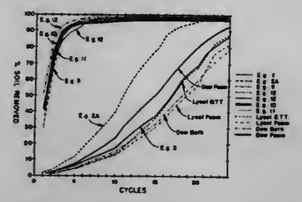
Scott C. Mills, Livermore, and Jennifer C. Julian, Dublin, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Apr. 12, 1996, Ser. No. 632,041
Int. Cl.[6] C11D *1/835;1/88*
U.S. Cl. 510—238 **14 Claims**

1. An aqueous hard surface cleaner with improved soil removal comprising:

(a) either (i) a combination of a nonionic surfactant and a quaternary ammonium surfactant or





(ii) an amphoteric surfactant, the total amount of said surfactant being present from about 0.001–10%, wherein said nonionic surfactant is selected from the group consisting of an alkoxylated alkylphenol ether, an alkoxylated alcohol, or a semi-polar nonionic surfactant which itself is selected from the group consisting of mono-long-chain alkyl, di-short-chain tri-alkyl amine oxides, alkylamidodialkyl amine oxides, phosphine oxides and sulfoxides;

(b) no more than 50% of at least one water-soluble or dispersible organic solvent having a vapor pressure of at least 0.001 mm Hg at 25° C.

(c) 0.01–25% of tetraammonium ethylenediamine - tetraacetate (tetraammonium EDTA) as a chelating agent; and

(d) the remainder, water.

5,814,592

NON-AQUEOUS, PARTICULATE-CONTAINING LIQUID DETERGENT COMPOSITIONS WITH ELASTICIZED, SURFACTANT-STRUCTURED LIQUID PHASE

Jay I. Kahn; Mark A. Smerznak, both of Cincinnati, Ohio; Axel Meyer, Brussels, Belgium; Angela L. Garland, Fairfield; Vincent J. Becks, Hamilton, both of Ohio, and Jean-Pol Boutique, Gembloux, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 24, 1997, Ser. No. 881,458
Int. Cl.[6] C11D *17/00;1/83;3/39*
U.S. Cl. 510—304 **18 Claims**

1. A non-aqueous, liquid, heavy-duty detergent in the form of a suspension of solid, substantially insoluble particulate material dispersed throughout a structured, surfactant-containing liquid phase, wherein:

A) said composition comprises from about 45% to 95% by weight of the composition of a structured, surfactant-containing liquid phase formed by combining:

i) from about 50% to 80% by weight of said liquid phase of one or more non-aqueous organic diluents; and

ii) from about 20% to 50% by weight of said liquid phase of an anionic surfactant-containing powder which is formed by co-drying:

a) one or more alkali metal salts of C_{10-16} linear alkyl benzene sulfonic acids; and

b) one or more non-surfactant salts;

to produce a powder which contains from about 45% to 94% by weight of said powder of said alkyl benzene sulfonic acid salts, from about 2% to 50% by weight of said powder of said non-surfactant salts and from about 0.5% to 4% by weight of said powder of residual water;

and which contains from about 10% to 60% by weight of said powder of a solid phase which is insoluble in said non-aqueous organic diluents; and

B) said composition also comprises from about 0.1 % to 5% by weight of the composition of finely divided, solid particulate material which has an average particle size ranging from about 7 to 40 nanometers and which has a specific surface area ranging from about 40 to 400 m^2/g; and

C) said composition also comprises from about 5% to 54.9% by weight of the composition of additional particulate material which ranges in size from about 0.1 to 1500 microns, which is substantially insoluble in said liquid phase and which is selected from peroxygen bleaching agents, bleach activators, organic detergent builders and organic alkalinity sources and combinations of said additional particulate material types.

5,814,593

Patent Not Issued For This Number

5,814,594

HEAVY OIL REMOVER

Jack T. Vlasblom, Dunedin, Fla., assignor to Citra Science Ltd., Pinellas Park, Fla.

Filed Nov. 17, 1997, Ser. No. 971,298
Int. Cl.[6] C11D *1/83;3/43*
U.S. Cl. 510—365 **22 Claims**

1. A heavy oil remover, comprising:

from about 3 to about 96 weight percent cyclic hydrocarbon solvent;

from about 1 to about 94 weight percent dipropylene glycol mono n-butyl ether;

from about 2 to about 95 weight percent salt of an alkyl aromatic sulfonic acid;

from about 0.1 to about 75 weight percent branched alcohol ethoxylate;

from about 0.1 to about 75 weight percent ethoxylated alkyl mercaptan; and

up to about 95 weight percent water.

5,814,595

AZEOTROPE-LIKE COMPOSITIONS AND THEIR USE

Richard M. Flynn, Mahtomedi; Dean S. Milbrath, Stillwater; John G. Owens, Woodbury; Daniel R. Vitcak, Cottage Grove, all of Minn., and Hideto Yanome, Kanagawa, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 442,399, May 16, 1995, abandoned. This application May 15, 1996, Ser. No. 649,743
Int. Cl.[6] C11D *7/26;7/30;7/60*
U.S. Cl. 510—411 **14 Claims**

1. An azeotrope-like composition including (a) perfluorobutyl ethyl ether which ether consists essentially of perfluoro-n-butyl ethyl ether and perfluoroisobutyl ethyl ether and (b) organic solvent, wherein the composition is selected from the group consisting of:

(i) compositions consisting essentially of about 89 to 38 weight percent of the ether and about 11 to 62 weight percent 1-chlorobutane that boil at about 68° to 70° C. at 736 torr;

(ii) compositions consisting essentially of about 94 to 71 weight percent of the ether and about 6 to 29 weight percent 1,2-dichloropropane that boil at about 73° to 75° C. at 738 torr;

(iii) compositions consisting essentially of about 76 to 40 weight percent of the ether and about 24 to 60 weight percent 2,2-dichloropropane that boil at about 65° to 67° C. at 731 torr;

(iv) compositions consisting essentially of about 46 to 4 weight percent of the ether and about 54 to 96 weight percent trans-1,2-dichloroethylene that boil at about 43° to 45° C. at 729 torr;

(v) compositions consisting essentially of about 95 to 68 weight percent of the ether and about 5 to 32 weight percent 2,3-dichloro-1-propene that boil at about 72° to 74° C. at 735 torr; and

(vi) compositions consisting essentially of about 78 to 21 weight percent of the ether and about 22 to 79 weight percent 1-bromopropane that boil at about 62° to 64° C. at 725 torr.

5,814,596

STRUCTURED DETERGENT PASTES AND A METHOD FOR MANUFACTURING DETERGENT PARTICLES FROM SUCH PASTES

Yousef Georges Aquad, Jeddah, Saudi Arabia; Brian Joseph Pangrle, Elk Grove Village, Ill., and Johan Gerwijn L. Pluyter, Strombeek-Bever, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US95/08794, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO96/00279, PCT Pub. Date Jan. 4, 1996
PCT Filed Jun. 23, 1995, Ser. No. 750,242
Claims priority, application European Pat. Off., Jun. 24, 1994, 94201821
Int. Cl.[6] C11D *17/06;3/37;3/33*
U.S. Cl. 510—444 **20 Claims**

1. A surfactant paste comprising, by weight:

from 50% to 95% anionic surfactant;

from 0% to 50% nonionic surfactant;

from 1% to 12% of a structuring agent selected from the group consisting of:

a. amino acids selected from the group consisting of lysine di-hydrochloride, L-arginine hydrochloride and mixtures thereof;

b. polymers having from 10 to 1,000,000 cationic functional groups per polymer, wherein the cationic functional groups are selected from the group consisting of carboxylate, amide, pyrrolidone, imidazole, imidazolinium and mixtures thereof; and

c. mixtures thereof; and

from 3 % to 30% water;

wherein the surfactant paste has a viscosity of at least 10 Pa.s at 70° C. and 25 sec^{-1}.

5,814,597

MULTICOMPONENT MIXTURES BASED ON WATER-SOLUBLE ALKALI METAL SILICATE COMPOUNDS AND THEIR USE, MORE PARTICULARLY AS BUILDERS IN DETERGENTS

Wilfried Raehse, Duesseldorf; Johann F. Fues, Grevenbroich; Kathleen Paatz; Wilhelm Beck, both of Duesseldorf, and Wolfgang Hlavacek, Brunn/Geb., all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/00604, § 371 Date Oct. 10, 1996, § 102(e) Date Oct. 10, 1996, PCT Pub. No. WO95/23841, PCT Pub. Date Sep. 8, 1995
PCT Filed Feb. 20, 1995, Ser. No. 700,485
Claims priority, application Germany, Mar. 1, 1994, 44 06 592.2
Int. Cl.[6] C11D *3/08*
U.S. Cl. 510—511 **23 Claims**

1. A solid material comprising alkali metal silicates having molar ratio of SiO_2 to M_2O of 0.8 to 4 wherein M is an alkali metal in homogeneous admixture with an inorganic or organic material wherein said solid material contains at least 10% by weight of water-soluble inorganic or organic salts as the inorganic or organic

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material, has an apparent density of at least 150 g/l and a BET surface of at least 5 m^2, said alkali metal silicates having a water content of less than 15% by weight and at least 50% by weight of the alkali metal silicates are present in the form of a chain, ring or flat structure, but not three-dimensionally cross-linked (Q_2 or Q_3 structure).

5,814,598

USE OF UNSATURATED ALIPHATIC ESTERS IN PERFUMERY

Charles Fehr, Versoix, and José Galindo, Les Avanchets, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

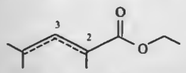
Filed Sep. 23, 1997, Ser. No. 936,196

Claims priority, application Switzerland, Oct. 23, 1996, 2589/96

Int. Cl.[6] A61K *7/46*

U.S. Cl. 512—26 **6 Claims**

1. A perfuming composition or a perfumed product, containing as a perfuming ingredient a compound of formula



(I)

having a double bond in one of the positions indicated by the dotted lines.

5,814,599

TRANSDERMAL DELIVERY OF ENCAPSULATED DRUGS

Samir S. Mitragotri, Cambridge; Daniel Blankschtein, Brookline, and Robert S. Langer, Newton, all of Mass., assignors to Massachusetts Insltiute of Technology, Cambridge, Mass.

Filed Aug. 4, 1995, Ser. No. 511,583

Int. Cl.[6] A61K *38/28;* **A61N** *1/30;* **A61M** *37/00;31/00*

U.S. Cl. 514—3 **9 Claims**

1. A method for enhancing delivery of a drug across the skin comprising applying the drug encapsulated in a liposome or polymeric microparticle to the skin in a pharmaceutically acceptable carrier having an absorbance coefficient equivalent to water and applying ultrasound at a frequency of between 20 kHz and less than 10 MHz at an intensity not causing any irreversible skin damage for a period of time effective to deliver the drug encapsulated in the liposome or microparticle across the skin in a desired drug dosage.

5,814,600

METHOD AND COMPOSITION FOR TREATMENT OF INSULIN REQUIRING MAMMALS

Timothy J. Rink, La Jolla, and Andrew A. Young, Alpine, both of Calif., assignors to Amylin Pharmaceuticals Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 127,705, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 704,995, May 24, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 259,762

Int. Cl.[6] A61K *38/28*

U.S. Cl. 514—4 **32 Claims**

1. A method of treating a mammal having a need for, or a reduced ability to produce, insulin, comprising administering to said mammal an insulin having a in vitro activity of stimulating glucose incorporation into glycogen in rat soleus muscle, and an amylin having the in vitro activity of suppressing glucose incorporation into glycogen in rat soleus muscle, wherein said insulin and said amylin are administered in a molar ratio of between about 1:1 and about 67:1.

5,814,601

METHODS AND COMPOSITIONS FOR OPTIMIZATION OF OXYGEN TRANSPORT BY CELL-FREE SYSTEMS

Robert M. Winslow, and Marcos Intaglietta, both of La Jolla, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 28, 1997, Ser. No. 810,694

Int. Cl.[6] A61K *38/16;35/14*

U.S. Cl. 514—6 **27 Claims**

1. A blood product solution, comprising an oxygen-carrying component comprising polyethylene glycol-modified hemoglobin, and a non-oxygen carrying component comprising a colloid starch, said blood product solution having oncotic pressure higher than that of plasma and viscosity at least half that of blood.

5,814,602

HEPARIN-BINDING PROTEINS

Hans Flodgaard, Hellerup; Erik Ostergaard, Vanlose; Johannes Thomsen, Kokkedal, and Stephen Bayne, Roskilde, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 994,053, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 583,393, Sep. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 325,138, Mar. 17, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,841

Claims priority, application Denmark, Mar. 17, 1988, 1453/88; Feb. 17, 1989, 737/89

Int. Cl.[6] A61K *38/17;38/18;* **C07K** *14/47;14/515*

U.S. Cl. 514—8 **10 Claims**

1. A purified and isolated porcine heparin-binding protein having the following amino acid sequence

```
1                5                   10                  15
Ile-Val-Gly-Gly-Arg-Arg-Ala-Gln-Pro-Gln-Glu-Phe-Pro-Phe-Leu-Ala-Ser-
                                                                20
                                                        -Ile-Gln-Lys-
21               25                  30                  35
Gln-Gly-Arg-Pro-Phe-Cys-Ala-Gly-Ala-Leu-Val-His-Pro-Arg-Phe-Val-
                                                                40
                                                        -Leu-Thr-Ala-Ala-
41               45                  50                  55
Ser-Cys-Phe-Arg-Gly-Lys-Asn-Ser-Gly-Ser-Ala-Ser-Val-Val-Leu-Gly-
                                                                60
                                                        -Ala-Tyr-Asp-Leu-
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-continued

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61               65                  70                  75
Arg-Gln-Gln-Glu-Gln-Ser-Arg-Gln-Thr-Phe-Ser-Ile-Arg-Ser-Ile-Ser-Gln-
                                                                80
                                                        -Asn-Gly-Tyr-
81               85                  90                  95
Asp-Pro-Arg-Gln-Asn-Leu-Asn-Asp-Val-Leu-Leu-Leu-Gln-Leu-Asp-Arg-
                                                               100
                                                        -Glu-Ala-Arg-Leu-
                                                   CHO
101              105                 110                 115
Thr-Pro-Ser-Val-Ala-Leu-Val-Pro-Leu-Pro-Pro-Gln-Asx-Ala-Thr-Val-
                                                               120
                                                        -Glu-Ala-Gly-Thr-
121              125                 130
Asn-Cys-Gln-Val-Ala-Gly-Trp-Gly-Thr-Gln-Arg-
                                     135                       140
                                        -Leu-Arg-Arg-Leu-Phe-Ser-Arg-Phe-Pro-
        CHO
141             145                 150
Arg-Val-Leu-Asx-Val-Thr-Val-Thr-Ser-Asn-Pro-
                                     155                       160
                                        -Cys-Leu-Pro-Arg-Asp-Met-Cys-Ile-Gly-
161              165                 170
Val-Phe-Ser-Arg-Arg-Gly-Arg-Ile-Ser-Gln-Gly-
                                     175                       180
                                        -Asp-Arg-Gly-Thr-Pro-Leu-Val-Cys-Asn-
181              185                 190                 195
Gly-Leu-Ala-Gln-Gly-Val-Ala-Ser-Phe-Leu-Arg-Arg-Arg-Phe-Arg-Arg-
                                                               200
                                                        -Ser-Ser-Gly-Phe-
201              205                 210                 215
Phe-Thr-Arg-Val-Ala-Leu-Phe-Arg-Asn-Trp-Ile-Asp-Ser-Val-Leu-Asn-
                                                               219
                                                        -Asn-Pro-Pro.
```

5,814,603

COMPOUNDS WITH PTH ACTIVITY

Kevin R. Oldenburg, Fremont, and Harold E. Selick, Belmont, both of Calif., assignors to Affymax Technologies N.V., Greenford, England

Continuation-in-part of Ser. No. 965,677, Oct. 22, 1992, abandoned, Ser. No. 77,296, Jun. 14, 1993, abandoned, and Ser. No. 898,219, Jun. 12, 1992, abandoned. This application Oct. 25, 1993, Ser. No. 142,551

Int. Cl.[6] A61K *38/29;* **C07K** *1/113*

U.S. Cl. 514—17 **3 Claims**

1. A peptide comprising the sequence

SVSEIQLMHNLGKHLNSMERVEWLRKKLQDVHNF (SEQ ID NO:2)

wherein:

positions 11, 19, 22, and 29 have been substituted with an arginine; and

position 34 is couple to Hol, Ho, a homoserine amide, or the sequence of amino acids comprising residues 35–84 of PTH (SEQ ID NO:1).

5,814,604

METHODS FOR INDUCING ENDOCHONDRAL BONE FORMATION COMPRISING ADMINISTERING CBMP-2A, CBMP-2B, AND/OR VIRANTS THEREOF

Hermann Oppermann; Thangavel Kuberasampath, both of Medway; David C. Rueger, West Roxbury, and Engin Ozkaynak, Milford, all of Mass., assignors to Stryker Corporation, Natick, Mass.

Continuation of Ser. No. 145,812, Nov. 1, 1993, which is a division of Ser. No. 995,345, Dec. 22, 1992, Pat. No. 5,258,494, which is a division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590. This application Apr. 4, 1995, Ser. No. 417,071

Int. Cl.[6] A61K *38/16;* **C07K** *14/51*

U.S. Cl. 514—12 **24 Claims**

1. A method of inducing endochondral bone formation in a mammal comprising the step of providing to a locus accessible to migratory progenitor cells of said mammal a protein, produced by expression of recombinant DNA in a host cell and substantially free of other contaminating proteins, comprising a pair of polypeptide chains disulfide bonded to form a dimeric species, each of said pair of polypeptide chains having less than 200 amino acids in a sequence comprising

```
        1                   10                  20
CBMP-2a CKRHPLYVDFSDVGWNDWIV
                            30                  40
        APPGYHAFYCHGECPFPLAD
                            50                  60
        HLNSTNHAIVQTLVNSVNSK
                            70                  80
        IPKACCVPTELSAISMLYLD
                            90                  100
        ENEKVVLKNYQDMVVEGCGCR

        or

        1                   10                  20
CBMP-2b CRRHSLYVDFSDVGWNDWIV
                            30                  40
        APPGYQAFYCHGDCPFPLAD
                            50                  60
        HLNSTNHAIVQTLVNSVNSS
                            70                  80
        IPKACCVPTELSAISMLYLD
                            90                  100
        EYDKVVLKNYQEMVVEGCGCR,
```

said dimeric species having a conformation capable of inducing bone formation when implanted in a mammal in association with a matrix.

5,814,605

THERAPEUTIC USES OF KERATINOCYTE GROWTH FACTOR

Glenn Francis Pierce, Rancho Santa Fe; Regina Mae Housley, Thousand Oaks, and Charles Frederick Morris, Newbury Park, all of Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Division of Ser. No. 312,483, Sep. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 40,742, Mar. 26, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 484,065

Int. Cl.[6] C07K *14/71;* **A61K** *38/18*

U.S. Cl. 514—12 **5 Claims**

1. A pharmaceutical composition comprising a therapeutically effective amount of a keratinocyte growth factor product and a non-aqueous carrier.

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5,814,606

Patent Not Issued For This Number

5,814,607

PULMONARY DELIVERY OF ACTIVE FRAGMENTS OF PARATHYROID HORMONE

John S. Patton, San Carlos, Calif., assignor to Inhale Therapeutic Systems, San Carlos, Calif.

Continuation of Ser. No. 232,849, Apr. 25, 1994, Pat. No. 5,607,915, which is a continuation of Ser. No. 953,397, Sep. 29, 1992, abandoned. This application Mar. 28, 1996, Ser. No. 625,586

Int. Cl.[6] A61K *38/29*

U.S. Cl. 514—12 **14 Claims**

1. A method for pulsatile systemic delivery of an N-terminal peptide fragment of parathyroid hormone (PTH) to a mammalian subject, said method comprising:

inhalation through the mouth by the subject of a dispersion of an N-terminal peptide fragment of PTH consisting of the first 34 to 38 amino acids of SEO ID No. 1 resulting in deposition of the peptide fragment in the alveolar region of the lungs and a subsequent rapid rise followed by a rapid fall in the serum concentration of said peptide fragment.

5,814,608

S-FLUORO-ANTHRACYCLINES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Fabio Animati, Rome; Federico Arcamone, Nerviano; Giuseppe Giannini, Turi; Paolo Lombardi, Cesate, and Edith Monteagudo, Pomezia, all of Italy, assignors to Bristol-Myers Squibb, S.p.A., Sermoneta, and A. Menarini Industrie Farmaceutiche Riunite S.R.L., Florence, both of Italy

PCT No. PCT/EP95/03061, § 371 Date Apr. 21, 1997, § 102(e) Date Apr. 21, 1997, PCT Pub. No. WO96/04292, PCT Pub. Date Feb. 15, 1996

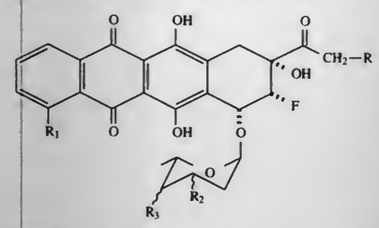
PCT Filed Aug. 1, 1995, Ser. No. 776,627

Claims priority, application Italy, Aug. 4, 1994, MI94A01696

Int. Cl.[6] C07H *15/252;* **A61K** *31/70;* **C07D** *309/06;* **C07C** *49/747*

U.S. Cl. 514—34 **6 Claims**

1. An 8-(R)-fluoro compound of the formula (I)



(I)

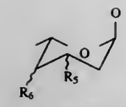
wherein:

R is selected from the group consisting of H, OH, OR_4 wherein R_4 is chosen in the group consisting of CHO, $COCH_3$, acyl derivative of a carboxylic acid containing up to 6 carbon atoms;

R_1 is chosen in the group consisting of: H, OH, OCH_3;

R_2 is chosen in the group consisting of: H, OH, NH_2

R_3 is chosen in the group consisting of: H, OH, NH_2, residue of formula (A)



(A)

wherein R_5 and R_6, same of different, are chosen in the group consisting of: H, OH, NH_2 and the symbol ⁓) indicates that the substituents R_2, R_3, R_5 and R_6 can be in the axial or equatorial configuration;

and wherein the groups 8—F and 9—OH have relative stereochemistry cis or a pharmaceutically acceptable salt.

5,814,609

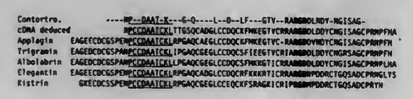
COMPOSITIONS CONTAINING A DISINTEGRIN AND METHODS FOR ITS USE IN PREVENTING METASTASIS AND OTHER CONDITIONS

Francis S. Markland, Jr., Manhattan Beach, and Qing Zhou, Alhambra, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 632,691, Apr. 15, 1996, Pat. No. 5,731,288, which is a division of Ser. No. 540,423, Oct. 10, 1995, abandoned, which is a continuation of Ser. No. 141,321, Oct. 22, 1993, abandoned. This application Nov. 8, 1996, Ser. No. 745,603

Int. Cl.[6] A61K *38/00;38/16;* **C07K** *14/00*

U.S. Cl. 514—12 **3 Claims**



1. A method of preventing tumor metastasis and neovascularization in a cancer patient suffering from melanoma, carcinoma, or sarcoma, comprising administering contrortrostatin to said patient in the amount effective to prevent metastasis.

5,814,610

OSTEOGENIC GROWTH OLIGOPEPTIDES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Itai Bab, M.P. Ayalon; Andras Muhlrad; Michael Chorev, both of Jerusalem; Arie Shteyer, Mevasseret Zion; Zvi Greenberg, Givat Zeev, and Nura Mansur, TelAviv-Jaffa, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Israel

PCT No. PCT/GB94/00416, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO94/20529, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 4, 1994, Ser. No. 530,277

Claims priority, application Israel, Mar. 4, 1993, 104954

Int. Cl.[6] A61K *35/18;37/36;* **C07K** *15/06;7/08*

U.S. Cl. 514—17 **20 Claims**

1. An oligopeptide having stimulatory activity on osteoblastic and/or fibroblastic cells, said oligopeptide having a molecular

weight of from 200 to 1,000 and comprising the amino acid sequence: Tyr-Gly-Phe-His-Gly (SEQ ID NO:2).

5,814,611

PHARMACEUTICAL FOR THE THERAPY OF IMMUNE DEFICIENCY CONDITIONS

German Mikhailovich Rakoviev; Vyacheslav Grigorievich Morozov; Vladimir Khatskelevich Khavinson, all of Leningrad; Vladislav Isakovich Deigin, and Andrei Marxovich Korotkov, both of Moscow, all of U.S.S.R., assignors to Cytoven J.V., Kirkland, Wash.

Continuation of Ser. No. 337,341, Nov. 10, 1994, Pat. No. 5,538,951, which is a continuation of Ser. No. 194,189, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 132,617, Oct. 7, 1993, abandoned, which is a continuation of Ser. No. 6,680, Jan. 21, 1993, abandoned, which is a continuation of Ser. No. 856,802, Mar. 24, 1992, which is a continuation of Ser. No. 415,283, Aug. 30, 1989. This application Jun. 7, 1995, Ser. No. 482,121

Int. Cl.[6] A61K *38/05;* **C07K** *5/072*

U.S. Cl. 514—19 **6 Claims**

1. A method for increasing the number of T-lymphocytes, B-lymphocytes or karyocytes in a subject suffering from staphylococcal pyoderma comprising administering to the subject a pharmaceutical preparation comprising a pharmaceutically acceptable vehicle and a purified dipeptide having the amino acid sequence L—Glu—L—Trp, or a salt of said dipeptide, in an amount sufficient to cause said increase.

5,814,612

RETINOL DERIVATIVES AND USES THEREOF

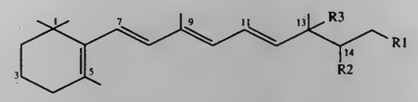
Jochen Buck; Ulrich Hammerling; Fadila Derguini, and Koji Nakanishi, all of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, and The Trustees of Columbia in the City of New York, both of New York, N.Y.

Continuation-in-part of Ser. No. 682,909, Apr. 9, 1991, Pat. No. 5,262,572. This application May 6, 1992, Ser. No. 880,041

Int. Cl.[6] A61K *37/22;* **C07D** *317/74*

U.S. Cl. 514—21 **7 Claims**

1. A purified retinoid compound having the structure:



wherein the configuration of the C7, C9, and C11 double bond independently is Z or E and the absolute configuration at C13 and C14 is independently R or S; wherein R1 is hydroxyl, alkyl, alkyl halide, alcohol, ester, ether, aldehyde, ketone, carboxylic acid, carboxylic ester, acyl halide, amide, nitrile, or amine; wherein R2 and R3 are independently hydroxyl, halide, alkoxy, ester, alkyl, alcohol, ether, aldehyde, ketone, carboxylic acid, carboxylic ester, nitrile, amine, azide, alkyl halide, acid halide, acid azide, or amide; or wherein R2 and R3, or R1 and R2 may be replaced by a 13,14-oxirane or 14,15-oxirane group, respectively.

5,814,613

ANTIBIOTIC LL-E19020 GAMMA

Guy Thomas Carter, Suffern; David R. Williams, Stony Point, and Joseph D. Korshalla, Pearl River, all of N.Y., assignors to Roche Vitamins Inc., Parsippany, N.J.

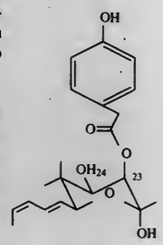
Filed Sep. 9, 1991, Ser. No. 756,411

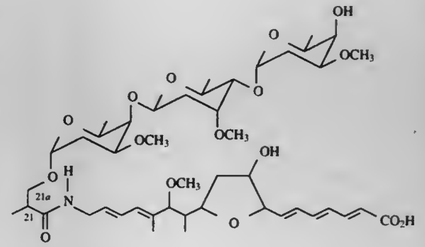
Int. Cl.[6] A01N *43/04;* **A61K** *31/71;* **C07H** *15/24;3/06*

U.S. Cl. 514—25 **3 Claims**

1. A compound LL-E19020 Gamma comprising

(a) the structure





(b) an elemental analysis:C 62.22; H 7.77; N 0.92;

(c) a molecular weight of 1241 (FABMS=M/Z 1264 corresponding to [M+Na]+);

(d) a specific optical rotation: $[\alpha]_D 26°$ C.=−7° C.(1.001, MeOH)

(e) a characteristic ultraviolet absorption spectrum as shown in FIG. I of the attached drawings;

(f) a characteristic infrared absorption spectrum as shown in Figure II of the attached drawings;

(g) a characteristic proton nuclear magnetic resonance spectrum as shown in Figure III of the attached drawings;

(h) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in Figure IV of the attached drawings,

(i) a characteristic HPLC retention time of 18.5 minutes using a gradient of acetonitrile in aqueous acetic acid; and

(j) a characteristic HPLC retention time of 19.6 minutes using a gradient of dioxane in aqueous acetic acid.

5,814,614

SUBSTITUTED GLUCOSE COMPOUNDS FOR TOXIC METAL ION REMOVAL FROM THE BODY

Theo P. A. Kruck, 46, Foxbar Road, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 601,606, Feb. 14, 1996, abandoned. This application Aug. 19, 1997, Ser. No. 914,088

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—25 **19 Claims**

1. A 2-deoxy-2-[N'-2'-alkyl-3'-hydroxypyrid-4'-one]-D-glucopyranose of the general formula:

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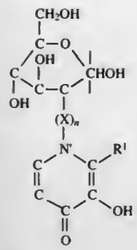
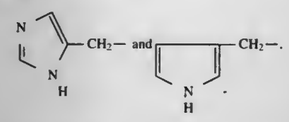
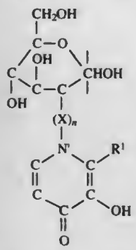


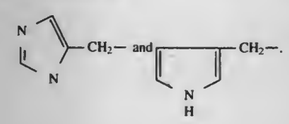
where x_n is —NHCO$(CH_2)_m$CHR^2— and m and n are 0 or 1; and R^1 is selected from methyl or ethyl, and R^2 is selected from hydrogen, CH_3—, $(CH_3)_2CH$—, $(CH_3)_2CHCH_2$—, $CH_3CH_2CH(CH_3)$—, $CH_3SCH_2CH_2$—, C_6H_5—CH_2—, $HOCH_2$—, $CH_3CH(OH)$—, $HSCH_2$—, HO—C_6H_4—CH_2—, H_2NCOCH_2—, $H_2NCOCH_2CH_2$—, $HOCOCH_2$—, $HOCOCH_2CH_2$—, $H_2NCH_2CH_2CH_2CH_2$—, $H_2NC(NH)NHCH_2CH_2CH_2$—,



9. A method for the removal of metal ions selected from the group consisting of aluminum (III) iron (II) and iron (III) from the body of a patient, said method comprising administering to said patient an effective amount of a 2-deoxy-2-[N'-2'-alkyl-3-hydroxypyrid-4-one]-D-glucopyranose of the general formula,



where x_n is —NHCO$(CH_2)_m$CHR^2— and n and m are 0 or 1; and R^1 is selected from methyl or ethyl, and R^2 is selected from hydrogen, CH_3—, $(CH_3)_2CH$—, $(CH_3)_2CHCH_2$—, $CH_3CH_2CH(CH_3)$—, $CH_3SCH_2CH_2$—, C_6H_5—CH_2—, $HOCH_2$—, $CH_3CH(OH)$—, $HSCH_2$—, HO—C_6H_4—CH_2—, H_2NCOCH_2—, $H_2NCOCH_2CH_2$—, $HOCOCH_2$—, $HOCOCH_2CH_2$—, $H_2NCH_2CH_2CH_2CH_2$—, $H_2NC(NH)NHCH_2CH_2CH_2$—,



5,814,615

ANTIBIOTIC LL-E19020 ALPHA$_1$

Guy Thomas Carter, Suffern; David R. Williams, Stony Point, and Joseph D. Korshalla, Pearl River, all of N.Y., assignors to Roche Vitamins Inc., Parsippany, N.J.

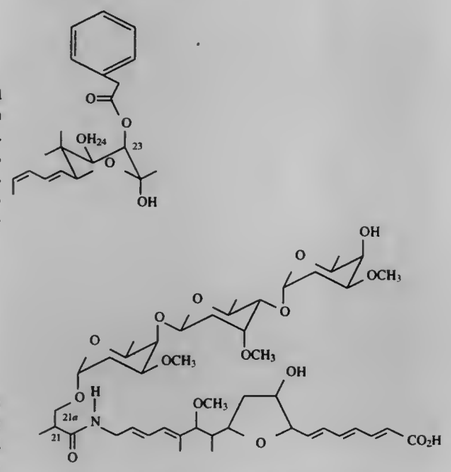
Filed Sep. 9, 1991, Ser. No. 756,646

Int. Cl.^{6} A61K *31/70;* **C07H** *3/06*

U.S. Cl. 514—25 **3 Claims**

1. A compound LL-E19020 Alpha$_1$ comprising

(a) the structure



(b) a molecular weight of 1225 (FABMS=M/Z 1248 corresponding to [M+Na]+);

(c) a molecular formula: $C_{65}H_{95}NO_{21}$

(d) a characteristic ultraviolet absorption spectra as shown in FIG. I of the attached drawings;

(e) a characteristic infrared absorption spectrum as shown in FIG. II of the attached drawings;

(f) a characteristic proton nuclear magnetic resonance spectrum as shown in FIG. III of the attached drawings; and

(g) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in FIG. IV of the attached drawings.

(h) a characteristic HPLC retention time of 23.1 minutes using a gradient of dioxane in aqueous acetic acid.

5,814,616

ADMINISTRATION OF VALIENAMINE-RELATED DISACCHARIDE COMPOUNDS IN REDUCING INFLAMMATION IN A SENSITIZED MAMMAL ARISING FROM EXPOSURE TO AN ANTIGEN

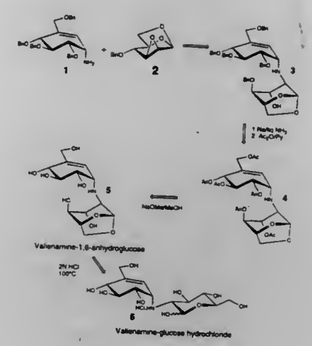
Om P. Srivastava; Roman Szweda; Richard H. Smith; Robert M. Ippolito, all of Edmonton, Canada, and Ulrike Spohr, Boulder, Colo., assignors to Alberta Research Council, Alberta, Canada

Continuation of Ser. No. 466,621, Jun. 6, 1995, Pat. No. 5,571,796. This application Nov. 5, 1996, Ser. No. 744,203

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—42 **2 Claims**

1. A method for reducing the degree of inflammation in a mammal arising from the initiation of a mammal's secondary immune response due to antigen exposure, which method comprises administering to said mammal an inflammation reducing effective amount of a valienamine-related disaccharide compound and pharmaceutically acceptable salts thereof.



5,814,617

PROTECTIVE 17 KDA MALARIA HEPATIC AND ERYTHROCYTIC STAGE IMMUNOGEN AND GENE

Stephen L. Hoffman, Gaithersburg; Yupin Charoenvit, Silver Spring; Richard C. Hedstrom, Gaithersburg, and Denise L. Doolan, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 7, 1994, Ser. No. 319,704

Int. Cl.^{6} A61K *31/505;* **C07K** *14/445*

U.S. Cl. 514—44 **11 Claims**

1. A vaccine for protecting a mammal by reducing the severity or incidence of infection by a malaria parasite of the genus Plasmodium, said vaccine comprising a first nucleic acid encoding a first polypeptide capable of eliciting an immune reaction against an antigen expressed during the liver stage and wherein said first nucleic acid comprises the nucleotide sequence encoding the homologue of PyHEP17 in other Plasmodium species selected from the group consisting of *Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale,* and *Plasmodium malariae.*

5,814,618

METHODS FOR REGULATING GENE EXPRESSION

Hermann Bujard, Heidelberg, Germany, and Manfred Gossen, El Cerrito, Calif., assignors to BASF Aktiengesellschaft, and Knoll Aktiengesellchaft, both of Ludwigshafen, Germany

Continuation-in-part of Ser. No. 260,452, Jun. 14, 1994, Pat. No. 5,650,298, Ser. No. 76,726, Jun. 14, 1993, Pat. No. 5,464,758, Ser. No. 383,754, Feb. 6, 1995, and Ser. No. 275,876, Jul. 15, 1994, Pat. No. 5,654,168, which is a continuation-in-part of Ser. No. 270,637, Jul. 1, 1994, abandoned, said Ser. No. 260,452 is a continuation-in-part of Ser. No. 76,327, Jun. 14, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 485,978

Int. Cl.^{6} A61K *48/00;* **C12N** *15/00*

U.S. Cl. 514—44 **30 Claims**

1. A method for regulating expression of a tet operator-linked gene in a cell of a subject, comprising:

introducing into the cell a nucleic acid molecule encoding a fusion protein which inhibits transcription in eukaryotic cells, the fusion protein comprising a first polypeptide which binds to a tet operator sequence, operatively linked to a heterologous second polypeptide which inhibits transcription in eukaryotic cells; and

modulating the concentration of a tetracycline, or analogue thereof, in the subject.

5,814,619

OLIGONUCLEOTIDE INHIBITION OF P120

Clarence Frank Bennett, Carlsbad, Calif., assignor to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Filed Apr. 8, 1994, Ser. No. 225,444

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—44 **2 Claims**

1. A method of inhibiting the synthesis of p120 comprising contacting cells suspected of having abnormal p120 expression with an amount effective to inhibit p120 of an oligonucleotide which hybridizes with mRNA encoding p120, said oligonucleotide consisting of a nucleotide sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 4 and SEQ ID NO: 5.

5,814,620

INHIBITION OF NEOVASCULARIZATION USING VEGF-SPECIFIC OLIGONUCLEOTIDES

Gregory S. Robinson, Acton, and Lois Elaine Hodgson Smith, West Newton, both of Mass., assignors to Hybridon, Inc., Cambridge, and Children's Medical Center Corporation, Boston, both of Mass.

Division of Ser. No. 378,860, Jan. 26, 1995, which is a continuation-in-part of Ser. No. 98,942, Jul. 27, 1993. This application Jul. 12, 1995, Ser. No. 501,356

Int. Cl.^{6} A61K *31/70;* **C12N** *5/10;* **C07H** *21/00;* **C12Q** *1/68*

U.S. Cl. 514—44 **8 Claims**

1. A method of treating diabetic retinopathy comprising the step of intravitreally administrating to a subject afflicted with diabetic retinopathy a therapeutic amount of an oligonucleotide specific for vascular endothelial growth factor nucleic acid and effective in inhibiting the expression of vascular endothelial growth factor in the retina.

5,814,621

DRUG COMPOSITION AND PROCESS FOR PREPARING THE SAME

Yoshio Kanaya; Hiroshi Yuasa, and Daisaku Oguni, all of Tokyo, Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 185,712, Jan. 24, 1994, abandoned. This application Jan. 25, 1996, Ser. No. 591,899

Claims priority, application Japan, Jan. 25, 1993, 5-028547

Int. Cl.^{6} A61K *31/715;31/725;31/73*

U.S. Cl. 514—54 **15 Claims**

1. A drug composition consisting essentially of a drug, which is more soluble in a water-miscible organic solvent than in water, and a mucopolysaccharide in a solid mucopolysaccharide-drug complex, wherein crystals or particles of the drug are disposed about a surface defined by particles of the mucopolysaccharide and wherein the drug in said complex dissolves in water faster than uncomplexed drug alone.

5,814,622

COMPOUNDS DERIVED FROM BORONIC ACID

Guillaume de Nanteuil, Suresnes; Philippe Gloanec, Bougival; Christine Lila, Viroflay; Bernard Portevin, Elancourt; Tony Verbeuren, Vernouillet; Alain Rupin, Savonnieres, and Serge Simonet, Conflans Sainte Honorine, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Feb. 27, 1997, Ser. No. 807,569

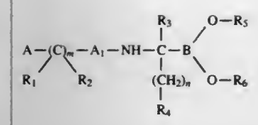
Claims priority, application France, Feb. 27, 1996, 96 02377

Int. Cl.^{6} A61K *31/69;* **C07F** *5/02;5/04*

U.S. Cl. 514—64 **27 Claims**

1. A compound selected from those of formula (I):

VOL 1214 ISS 5 SEP 29 1998 UMI



(I)

in which:

R_1 and R_2, which are identical or different, represent hydrogen or linear or branched (C_1–C_6) alkyl or alternatively R_1 and R_2 form, with the carbon atom which bears them, a (C_3–C_8) cycloalkyl,

R_3 represents hydrogen or linear or branched (C_1–C_6) alkyl, an optionally substituted phenyl or optionally substituted benzyl,

R_4 represents:

amino optionally substituted with one or more identical or different linear or branched (C_1–C_6) alkyl or optionally substituted benzyl, aryl, or heterocyclic groups,

amidino optionally substituted with one or more identical or different linear or branched (C_1–C_6) alkyl or optionally substituted benzyl, aryl, or heterocyclic groups,

guanidino optionally substituted with a linear or branched (C_1–C_6) alkyl or optionally substituted benzyl, aryl, or heterocyclic group,

isothioureido optionally substituted with linear or branched (C_1–C_6) alkyl or optionally substituted benzyl, aryl, or heterocyclic group,

iminomethylamino optionally substituted with linear or branched (C_1–C_6) alkyl,

mercapto substituted with a heterocyclic group,

or a heterocyclic group,

R_5 and R_6 each represent hydrogen or linear or branched (C_1–C_6) alkyl;

or

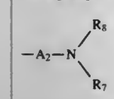
forms a boronic ester of pinanediol,

m represents zero to 6 inclusive,

n represents one to 6 inclusive,

A represents any one of the following groups:

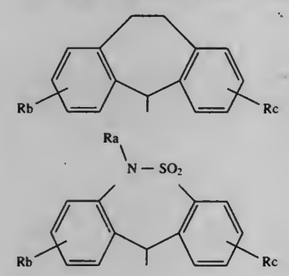
bicycloalkyl (C_5–C_{10}) phenyl optionally substituted with one or more identical or different halogen atoms, linear or branched (C_1–C_6) alkyl, linear or branched (C_1–C_6) alkoxy, hydroxyl, or amino groups optionally substituted with one or two groups, which are identical or different, selected from linear or branched (C_1–C_6) alkyl, and linear or branched (C_1–C_6) alkylsulfonyl or arylsulfonyl, or a group of formula:



on condition that, in this case, m is other than zero,

in which:

R_7 and R_8, which are identical or different, represent hydrogen, linear or branched (C_1–C_6) alkyl optionally substituted with one or more aryl, heterocyclic, arylsulfonylamino, or (C_5–C_{10}) bicycloalkyl phenyl which is optionally substituted with one or more groups as defined above under A or indanyl, linear or branched (C_1–C_6) alkylsulfonyl, arylsulfonyl, aryl, heterocyclic, or bicycloalkyl (C_5–C_{10}) phenyl which is optionally substituted with one or more groups as defined above under A, indanyl, or either of the groups:



in which:

Ra represent linear or branched (C_1–C_6) alkyl or optionally substituted phenyl,

Rb and Rc, which are identical or different, represent hydrogen or balogen or linear or branched (C_1–C_6) alkyl, linear or branched (C_1–C_6) alkoxy, hydroxyl, substituted or unsubstituted amino, or trihalomethyl,

A_2 represents —CO— or —CS—,

A_1 represents —CO—, —CS—, or —SO_2—, the stereo and geometric isomers thereof, and the addition salts thereof with a pharmaceutically-acceptable acid or base.

5,814,623

PARENTERAL SOLUTIONS CONTAINING 7-HALO-1,2,3,4-TETRAHYDRO-3-ARYL-6-QUINAZOLINE SULFONAMIDES

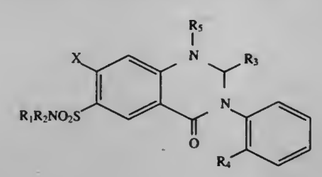
Vasant Ranade, Libertyville, Ill., assignor to Academic Pharmaceuticals, L.P., Lake Bluff, Ill.

Continuation of Ser. No. 387,477, Feb. 13, 1995, Pat. No. 5,633,240, which is a continuation-in-part of Ser. No. 299,493, Sep. 1, 1994, Pat. No. 5,684,009. This application May 27, 1997, Ser. No. 863,961

Int. Cl.[6] A61K *31/63;31/505*

U.S. Cl. 514—155 **13 Claims**

1. A solution suitable for parenteral administration comprising an anti-hypertensive of a compound of the formula



wherein X is halogen;

R_1, R_2, R_3, R_4 are independently selected from hydrogen and alky! having from 1 to 6 carbon atoms; and

R_5 is hydrogen or alkyl having from 1 to 6 carbon atoms, dissolved in an aqueous Bis-Tris buffer system having a pH of from about 10.5 to 12.5.

5,814,624

METHOD FOR OBTAINING ESTROGENS FROM PREGNANT MARE URINE BY SOLID-PHASE EXTRACTION

Ivan Ban, Hanover; Friederich Borchers, Laatzen; Henning-Heinemann, Lehrte-Aligse, and Heinz-Helmer Rasche, Burgdorf, all of Germany, assignors to Solvay Deutschland GmbH, Hanover, Germany

Continuation of Ser. No. 799,812, Feb. 13, 1997, abandoned, which is a continuation of Ser. No. 623,396, Mar. 27, 1996, abandoned, which is a continuation of Ser. No. 372,164, Jan. 12, 1995, abandoned. This application Sep. 18, 1997, Ser. No. 933,089

Claims priority, application Germany, Feb. 8, 1994, 44 03 885.2; Oct. 26, 1994, 44 38 273.1

Int. Cl.[6] A61K *35/22*

U.S. Cl. 514—170 **11 Claims**

1. A method for obtaining a natural mixture, depleted in phenolic urine contents, of conjugated estrogens from pregnant mare urine, said method comprising the steps of:

a) treating a pregnant mare urine material with a quantity of a water-soluble base sufficient to establish a pH value of at least 12, said mare urine material being selected from the group consisting of urine freed of mucilaginous substances and solids, a concentrate formed by reducing the volume of urine freed of mucilaginous substances and solids, and a urine retentate obtained by membrane filtration of urine freed of mucilaginous substances and solids; and then adding a sufficient quantity of an aqueous acid solution to adjust the treated urine material to a pH value in the range from 5 to 8.5;

b) contacting the treated urine material from step a) having a pH of 5 to 8.5, with a quantity of a hydrophobized silica gel sufficient to adsorb conjugated estrogens contained therein, and separating a hydrophobized silica gel laden with a mixture of conjugated estrogens from a residual urine material;

c) washing the estrogen-laden hydrophobized silica gel with an aqueous buffer solution having a pH of from 5 to 7, and

d) contacting the washed hydrophobized silica gel with a quantity of an elution liquid sufficient to desorb the mixture of conjugated estrogens adsorbed thereon, said elution liquid comprising a mixture of water and a water-miscible organic solvent selected from the group consisting of water-miscible ethers, lower alkanols and lower aliphatic ketones, and recovering an eluate solution containing said mixture of conjugated estrogens.

5,814,625

CHEMOPREVENTION OF METACHRONOUS ADENOMATOUS COLORECTAL POLYPS

Mark V. Larson, Elgin; David A. Ahlquist, and Randall K. Pearson, both of Rochester, all of Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Continuation-in-part of Ser. No. 621,781, Mar. 22, 1996. This application Sep. 23, 1996, Ser. No. 717,556

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—171 **4 Claims**

1. A method for protecting a colorectum against a recurrence of colorectal adenomas comprising administering to a human afflicted with colorectal adenomas, an amount of ursodeoxycholic acid or a pharmaceutically-acceptable salt thereof, and an amount of a non-steroidal anti-inflammatory agent effective to prevent the recurrence of colorectal adenomas following the removal thereof.

5,814,626

Patent Not Issued For This Number

5,814,627

3, 5-DISUBSTITUTED AND 3, 4, 5-TRISUBSTITUTED 2-ISOXAZOLINES AND ISOXAZOLES, PROCESS FOR THEIR PREPARATION AND THEIR USE AS PHARMACEUTICALS

Wilfried Schwab; Hiristo Anagnostopulos, both of Wiesbaden; Robert Ryder Bartlett, Darmstadt; Rudolf Schleyerbach, and Klaus Ulrich Welthmann, both of Hofheim, all of Germany, assignors to Hoechst Aktienegesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP95/00784, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO95/24397, PCT Pub. Date Sep. 14, 1995

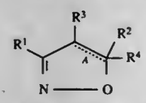
PCT Filed Mar. 3, 1995, Ser. No. 704,743

Claims priority, application Germany, Mar. 10, 1994, 44 08 084.0

Int. Cl.[6] A61K *31/42;31/535;* **C07D** *261/04;413/12*

U.S. Cl. 514—236.8 **12 Claims**

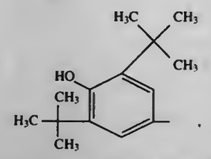
1. A compound of the formula I



(I)

and/or a physiologically tolerated salt of the compound of the formula I

and/or a stereoisomeric form of the compound of the formula I; in this context, one radical R^1 or R^2 has the meaning of the formula II



(II)

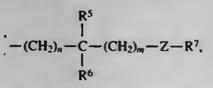
and the other radical R^1 or R^2 has the following meaning:

a) pyridyl,

b) thiopbenyl,

c) thiazolyl,

d) a radical of the formula III



(III)

where n is the number zero, 1, 2, 3, 4, 5 or 6,

m is the number zero, 1, 2, 3 or 4,

Z is

1) —O—, or

2) —NH—,

R^5 and R^6 are, independently of each other,

1) a hydrogen atom,

2) (C_1–C_4)-alkyl,

3) (C_2–C_4)-alkenyl,

4) (C_2–C_4)-alkynyl,

5) phenyl, or

6) OH, and

R^7 is

1) a hydrogen atom,

2) residue of an amino acid,

3) trifluoromethylsulfonyl,

4) —O—P(O)$(OH)_2$,

5) —O—P(O)$(OH)_2$ mono- or diesterified with phenyl or (C_1–C_6)-alkyl, or

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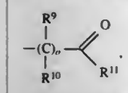
6) a radical of the formula IV



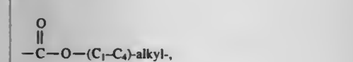
(IV)

in which o is the number zero or 1, and in which R^9 and R^{10}, independently of each other, have the following meaning:

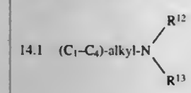
1) a hydrogen atom, or
2) (C_1-C_4)-alkyl, and

R^{11} is

1) OH,
2) —O—(C_1-C_4)-alkyl,
3) (C_1-C_{20})-alkyl,
4) (C_1-C_{20})-alkyl, substituted once or more than once, independently of each other, by
   4.1 —COOH,
   4.2 —OH,
   4.3 O-acetyl, or
   4.4 =O,
5) —COOH,
6)



7) N-glycyl,
8) N-glycyl-(C_1-C_4)-alkyl ester,
9) N-(C_1-C_4)-alkylhydroxylamino,
10) N-(1H-tetrazol-5-yl)amino,
11) 5-methylisoxazol-4-yl,
12) 1-cyano-2-hydroxy-1-propenyl,
13) phenyl,
14) phenyl, substituted once or more than once by



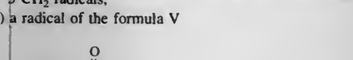
14.1 (C_1-C_4)-alkyl-N

in which R^{12} and R^{13}, independently of each other, have the following meaning:

1) a hydrogen atom,
2) (C_1-C_4)-alkyl,
3) phenyl-(C_1-C_2)-alkyl,
4) R^{12} and R^{13} form, together with the nitrogen atom linking them, a five- to seven-membered heterocycle which is unsubstituted or substituted once to three times by (C_1-C_4)-alkyl, it being possible for a carbon atom to be replaced by a sulfur, oxygen or nitrogen atom, or
5) residue of an amino acid, or

R^6 and R^7 are bonded to each other and are, together, from 1 to 3 CH_2 radicals,

e) a radical of the formula V



(V)

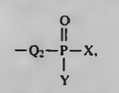
in which Q_1 is

1) —$(CH_2)_m$—, where m is the number zero, 1, 2, 3 or 4, or
2) —CH=CH—, and

R^8 is

1) a hydrogen atom,
2) (C_1-C_4)-alkyl,
3) OH,
4) —O—(C_1-C_4)-alkyl,
5) NH_2,
6) N-(1H-tetrazol-5-yl)amino, or
7) N-(3,5-dimethyl-4-hydroxybenzyl)amino, or

f) a radical of the formula VI



(VI)

in which Q_2 is

1) —$(CH_2)_m$, where m is the number zero, 1, 2, 3 or 4, or
2) —CH=CH—, and

X and Y are, independently of each other,

1) (C_1-C_4)-alkyl,
2) —O—(C_1-C_4)-alkyl, or
3) OH,

. . . A . . . is a double bond which is present or absent, with the restriction that the double bond and the radical R^4 are not present simultaneously,

R^4 is

1) a hydrogen atom, or
2) (C_1-C_6)-alkyl, or

R^2 and R^4 form, together with the carbon atom to which they are bonded, an aliphatic ring which is composed of 3, 4 or 5 carbon atoms, and

R^3 is

1) a hydrogen atom,
2) (C_1-C_4)-alkyl, or
3) hydroxy-(C_1-C_4)-alkyl.

5,814,628

BENZYL-SUBSTITUTED COMPOUNDS HAVING DOPAMINE RECEPTOR AFFINITY

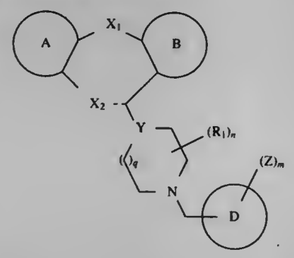
Jian-Min Fu, Brampton; Ashok Tehim, Mississauga, and Robert A. Kirby, Acton, all of Canada, assignors to Allelix Biopharmaceuticals Inc., Mississauga, Canada

Division of Ser. No. 354,766, Dec. 12, 1994, Pat. No. 5,602,120. This application Dec. 10, 1996, Ser. No. 762,984

Int. Cl.[6] **C07D** *401/14;403/14;* **A61K** *31/55*

U.S. Cl. 514—220 **11 Claims**

1. The compound of Formula 1:



wherein:

A and B are benzene unsubstituted or substituted with 1–3 substituents selected independently from hydroxyl, halo, C_{1-4}alkyl, amino, nitro, cyano, halo-substituted C_{1-4}alkyl, C_{1-4}alkoxy, halo-substituted C_{1-4}alkoxy, C_{1-4}alkoxycarbonyl, C_{1-4}acyl, cyclo-C_{3-7}alkyl, thiol-C_{1-4}alkylene, C_{1-4}alkylthio, halo-substituted C_{1-4}alkylthio, cyanothio, tetrazolyl, N-piperidinyl, N-piperazinyl, N-morpholinyl, acetamido, C_{1-4}alkylsulfonyl, halosulfonyl, halo-substituted C_{1-4}alkylsulfonyl, C_{1-4}alkylSO—, sulfonamido, C_{1-4}alkylseleno, and OSO_3H;

X_1 is selected from NH, N—C_{1-4}alkyl, and N-acetyl;

X_2—is N=;

Y is selected from CH and N;

Z is cyano;

R_1 represents C_{1-4}alkyl;

m is 1, 2 or 3;

n is 0, 1 or2;

q is 1 or 2; and

D is benzene; and acid addition salts or hydrates thereof.

5,814,629

MICROBICIDES

Peter Stanetty, Harmannsdorf, Austria, and Walter Kunz, Oberwil, Switzerland, assignors to Novartis Finance Corporation, New York, N.Y.

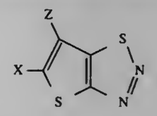
Filed Dec. 19, 1996, Ser. No. 770,074

Claims priority, application Switzerland, Dec. 20, 1995, 03613/95

Int. Cl.[6] **H01N** *43/878;43/84;* **C07D** *513/04*

U.S. Cl. 514—234.2 **16 Claims**

1. A compound of formula I



I

wherein:

the substituents R_1 are identical or different and are C_1-C_4alkyl that is unsubstituted or substituted by phenyl, C_1-C_2 alkoxy, phenoxy, or benzyloxy;

or two substituents OR_1 together with the carbon atom to which they are bonded, form a cyclic acetal group that is unsubstituted or substituted by C_1-C_3alkyl, phenyl, benzyl, hydroxy, or C_1-C_3 hydroxyalkyl;

R_2 to R_7 are hydrogen, an unsubstituted or substituted, open-chained, saturated or unsaturated hydrocarbon radical containing up to 8 carbon atoms, an unsubstituted or substituted, cyclic, saturated or unsaturated hydrocarbon radical containing up to 10 carbon atoms, unsubstituted or substituted benzyl or phenethyl, an unsubstituted or substituted acyl group containing up to 8 carbon atoms, an unsubstituted or substituted benzoyl group, or an unsubstituted or substituted heterocyclyl radical; or

R_3 and R_4, together with the nitrogen atom to which they are bonded, form a 5- or 6 -membered, unsubstituted or substituted heterocycle having from 1 to 3 hetero atoms selected from O, S, and N; or

R_6 and R_7, together with the atom to which they are bonded, form a 5- to 7-membered, unsubstituted or substituted carbocyclic or heterocyclic ring having from 1 to 3 hetero atoms selected from O, S, and N;

R_8, R_9, and R_{10} is each hydrogen, C_1-C_4alkyl, benzyl, C_1-C_4acyl, or benzoyl;

A is hydrogen, halogen, OR_2, SR_2, $N(R_3)R_4$, NH—OR_5, O—NCR_6R_7, O—N R_6R_7, NH—NCR_6R_7, or NH—NR_6R_7;

X is hydrogen, halogen, C_1-C_4alkyl, SR_8, $N(R_9)R_{10}$, CH_2OH, CHO, or $COOR_8$; and

Z is hydrogen, halogen, unsubstituted methyl, CN, CO—A, CS—A, or $CH(OR_1)_2$; in free form or in the form of a salt;

with the proviso that when Z is methyl, X is not $COOC_2H_5$.

5,814,630

QUINAZOLINE COMPOUNDS

Andrew John Barker, and Craig Johnstone, both of Macclesfield, United Kingdom, assignors to Zeneca Limited, London, United Kingdom

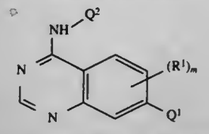
Filed Feb. 13, 1997, Ser. No. 800,830

Claims priority, application United Kingdom, Feb. 14, 1996, 9603097

Int. Cl.[6] **A61K** *31/505;31/495;* **C07D** *403/02;401/02*

U.S. Cl. 514—234.5 **7 Claims**

1. A quinazoline compound of the formula I



I

wherein Q^1 is a 5- or 6-membered heteroaryl moiety containing up to 3 heteroatoms selected from oxygen, nitrogen and sulphur, which heterocyclic moiety is a single ring or is fused to a benzo ring, and Q^1 optionally bears up to 3 substituents selected from halogeno, hydroxy, amino, trifluoromethyl, cyano, nitro, carboxy, carbamoyl, (1–4C)alkoxycarbonyl, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylamino, di-[(1–4C)alkyl]amino, pyrrolidin-1-yl, piperidino, morpholino, piperazin-1-yl, 4-(1–4C)alkylpiperazin-1yl, (2–4C)alkanoylamino, N-(1–4C)alkylcarbamoyl, N,N-di-[(1–4C)-alkyl]carbamoyl, amino-(1–4C)alkyl, (1–4C)alkylamino-(1–4C)-alkyl, di-[(1–4C)alkyl] amino-(1–4C)alkyl, pyrrolidin-1-yl-(1–4C)-alkyl, piperidino-(1–4C)alkyl, morpholino-(1–4C)alkyl, piperazin-1-yl-(1–4C)alkyl, 4-(1–4C)alkylpiperazin-1-yl-(1–4C)alkyl, halogeno-(2–4C)alkoxy, hydroxy-(2–4C)alkoxy, (1–4C)alkoxy-(2–4C)alkoxy, amino-(2–4C)alkoxy, (1–4C)alkylamino-(2–4C)-alkoxy, di-[(1–4C)alkyl]amino-(2–4C)alkoxy, pyrrolidin-1-yl-(2–4C)alkoxy, piperidino-(2–4C)alkoxy, morpholino-(2–4C)-alkoxy, piperazin-1-yl-(2–4C)alkoxy, 4-(1–4C)alkylpiperazin-1-yl-(2–4C)alkoxy, (1–4C)alkylthio-(2–4C)alkoxy, (1–4C)alkyl-sulphinyl-(2–4C)alkoxy, (1–4C)alkylsulphonyl-(2–4C)alkoxy, halogeno- (2–4C)alkylamino, hydroxy-(2–4C)alkylamino, (1–4C)-alkoxy(2–4C)alkylamino, amino-(2–4C)alkylamino, (1–4C)-alkylamino-(2–4C)alkylamino, di-[(1–4C)alkyl]amino-(2–4C)-alkylamino, pyrrolidin-1-yl-(2–4C)alkylamino, piperidino-(2–4C)-alkylamino, morpholino-(2–4C)alkylamino, piperazin-1-yl-(2–4C)-alkylamino, 4-(1–4C)alkylpiperazin-1-yl-(2–4C)alkylamino, N-(1–4C)alkyl-halogeno-(2–4C)alkylamino, N-(1–4C)alkyl-hydroxy-(2–4C)alkylamino, N-(1–4C)alkyl-(1–4C)alkoxy-(2–4C)-alkyl-amino, halogeno-(2–4C)alkanoylamino, hydroxy-(2–4C)alkanoyl-amino, (1–4C)alkoxy-(2–4C)alkanoylamino, (3–4C)alkenoyl-amino, (3–4C)alkynoylamino, amino-(2–4C)alkanoylamino, (1–4C)alkylamino-(2–4C)alkanoylamino, di-[(1–4C)alkyl]amino-(2–4C)alkanoylamino, pyrrolidin-1-yl-(2–4C)alkanoylamino, piperidino-(2–4C)alkanoylamino, morpholino-(2–4C)alkanoyl-amino, piperazin-1-yl-(2–4C)alkanoylamino and 4-(1–4C)alkyl-piperazin- 1-yl-(2–4C)alkanoylamino, and wherein any of the above-mentioned substituents comprising a CH_2 (methylene) group which is not attached to a halogeno, SO or SO_2 group or to a N, O or S atom optionally bears on said CH_2 group a substituent selected from hydroxy, amino, (1–4C)alkoxy, (1–4C)alkylamino and di-[(1–4C)alkyl]amino;

wherein m is 1 or 2 and each R^1 is independently hydrogen, halogeno, trifluoromethyl, hydroxy, amino, nitro, cyano, carboxy, carbamoyl, (1–4C)alkoxycarbamoyl, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylamino, di-[(1–4C)alkyl]amino, (2–4C)alkanoylamino, N-(1–4C)alkylcarbamoyl or N,N-di-[(1–4C)alkyl]carbamoyl;

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and wherein Q^2 is phenyl which optionally bears up to 3 substituents selected from halogeno, trifluoromethyl, cyano, hydroxy, amino, nitro, carboxy, carbamoyl, (1–4C)alkoxycarbonyl, (1–4C)alkyl, (1–4C)alkoxy, (1–4C)alkylamino, di-[(1–4C)alkyl]amino, (2–4C)alkanoylamino, N-(1–4C)-alkylcarbamoyl and N,N-di-(1–4C)alkylcarbamoyl;

or a pharmaceutically-acceptable salt thereof.

5,814,631

QUINAZOLINE DERIVATIVES AND APPLICATIONS THEREOF

Harukazu Fukami, Kyoto; Akiko Ito, Ibaraki; Shinjiro Niwata, Takatsuki; Saki Kakutani, Ibaraki; Motoo Sumida, Uji, and Yoshinobu Kiso, Ibaraki, all of Japan, assignors to Suntory Limited, Osaka, Japan

PCT No. PCT/JP96/02830, § 371 Date May 8, 1997, § 102(e) Date May 8, 1997, PCT Pub. No. WO97/11941, PCT Pub. Date Mar. 4, 1997

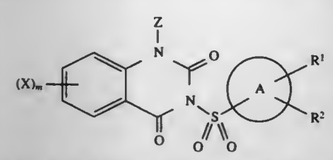
PCT Filed Sep. 27, 1996, Ser. No. 849,114

Claims priority, application Japan, Sep. 28, 1995, 7-285437; May 10, 1996, 8-116557

Int. Cl.[6] A61K *31/495;31/505;* **C07D** *239/72;403/02*

U.S. Cl. 514—234.5 **21 Claims**

1. A pharmaceutical composition comprising a quinazoline derivative or a pharmaceutically acceptable salt thereof in a pharmaceutically effective amount, and a pharmaceutically acceptable carrier therefor, the quinazoline derivative having the general formula (1):



(I)

wherein the ring A represents a benzene ring, a pyridine ring, a pyrrole ring, or a pyrazole ring, m represents 0, 1, or 2,

X represents a hydroxy group, a nitro group, a halogen atom, a C_1 to C_4 lower alkyl group which may be substituted with a halogen atom, a C_1 to C_4 lower alkoxy group which may be substituted with a halogen atom, or a C_7 to C_{12} aralkyloxy group, or X together with the benzene ring which is shown as substituted with said X, represents a group forming a naphthalene ring or a quinoline ring,

R^1 and R^2 are the same or different and represent a hydrogen atom, a halogen atom, a C^1 to C^4 lower alkyl group which may be substituted with a halogen atom, a nitro group, a cyano group, a pyrazolyl group, a tetrazolyl group, a carboxyl group which may be esterified with a C_1 to C_4 lower alkyl group or an allyl group, or a C_1 to C_4 lower alkoxy group which may be substituted with one or more substituent groups selected from the group consisting of a halogen atom, a morpholino group, a phenylpiperazinyl group, and a carboxyl group which may be esterified with a C_1 to C_4 lower alkyl group or an allyl group, or, when the ring A represents a benzene ring R^1 and R^2 together with benzene ring which is shown as substituted with said R^1 and R^2 represent a group forming a naphthalene ring or a quinoline ring, and

Z represents a hydrogen atom, a C_1 to C_4 lower alkyl group which may be substituted with a halogen atom, a C_2 to C_5 alkenyl group, an unsubstituted or substituted aralkyl group, an unsubstituted or substituted aromatic heterocyclic alkyl group, a carboxymethyl group which may be esterified with a C_1 to C_4 lower alkyl group or an allyl group, a carbonylmethyl group which is amidized with a primary or secondary or cyclic amine, an unsubstituted or substituted arylcarbonylmethyl group, or an unsubstituted or substituted aralkyloxymethyl group.

5,814,632

IMMUNOPOTENTIATING AND INFECTION PROTECTIVE AGENT AND PRODUCTION THEREOF

Seiichi Araki; Mamoru Suzuki, and Masatoshi Fujimoto, all of Ibaraki Prefecture, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 204,333, Mar. 14, 1994, abandoned. This application Apr. 12, 1995, Ser. No. 420,632

Claims priority, application Japan, Sep. 13, 1991, 3-261288

Int. Cl.[6] A61K *31/525*

U.S. Cl. 514—251 **2 Claims**

1. A method for treatment of diseases selected from the group consisting of: in humans, leukopenia, autoimmune diseases, sepsis and urinary tract infection; in swine, diarrhea, epidemic pneumonia, atrophic rhinitis and infectious gastroenteritis; in domestic fowl, pneumonia and Marek's disease; in bovines, diarrhea, pneumonia and udder inflammation; and in cats, leukemia, which comprises administering to a human or animal patient selected from the group consisting of swine, domestic fowl, bovines and cats, in need of such treatment a composition consisting of riboflavin and/or a riboflavin derivative.

5,814,633

IMINOOXYMETHYLENE ANILIDES, PROCESS FOR PREPARING THE SAME AND THEIR USE

Bernd Müller, Frankenthal; Hubert Sauter, Mannheim; Franz Röhl, Schifferstadt; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Hambach, and Norbert Götz, Worms, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/04430, § 371 Date May 20, 1997, § 102(e) Date May 20, 1997, PCT Pub. No. WO96/16044, PCT Pub. Date May 30, 1996

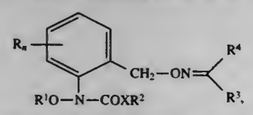
PCT Filed Nov. 10, 1995, Ser. No. 849,087

Claims priority, application Germany, Nov. 23, 1994, 44 41 676.8

Int. Cl.[6] C07D *239/32;213/84;* **A01N** *43/48;43/64*

U.S. Cl. 514—241 **15 Claims**

1. An iminooxymethyleneanilide of the formula I



(I)

where the index and the substituents have the following meanings:

n is 0, 1, 2, 3 or 4, it being possible for the substituents R to be different if n is greater than 1;

R is nitro, cyano, halogen,

C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_1–C_{10}-alkoxy, C_3–C_{10}-alkenyloxy and C_3–C_{10}-alkynyloxy, it being possible for these groups to be partially or completely halogenated and/or to carry one to three of the following radicals:

cyano, nitro, hydroxyl, amino, formyl, carboxyl, aminocarbonyl,

C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_1–C_6-alkylcarbonyl, C_1–C_6-alkoxycarbonyl, C_1–C_6-alkylcarbonyloxy, C_1–C_6-alkylaminocarbonyl, di-C_1–C_6-alkylaminocarbonyl, C_1–C_6-alkylcarbonylamino, C_1–C_6-alkoxycarbonylamino, C_1–C_6-alkylcarbonyl-N-C_1–C_6-alkylamino, and

CR^{iii}=NOR^{iv}, R^{iii} being hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or C_3–C_{12}-cycloalkyl and R^{iv} being C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl or aryl-C_1–C_6-alkyl,

C_3–C_{12}-cycloalkyl, C_3–C_{12}-cycloalkoxy, C_3–C_{12}-cycloalkylthio, C_3–C_{12}-cycloalkylamino, C_3–C_{12}-cycloalkyl-N-C_1–C_6-alkylamino, each of which is unsubstituted or substituted by customary groups,

3- to 12-membered heterocyclyl, heterocyclyloxy, heterocyclylthio, heterocyclylamino or heterocyclyl-N-C_1–C_6-alkylamino, each of which is unsubstituted or substituted by customary groups,

aryl, aryloxy, arylthio, arylamino, aryl-N-C_1–C_6-alkylamino, aryl-C_1–C_6-alkoxy, aryl-C_1–C_6-alkylthio, aryl-C_1–C_6-alkylamino, aryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, hetaryl, hetaryloxy, hetarylthio, hetarylamino, hetaryl-N-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkoxy, hetaryl-C_1–C_6-alkylthio, hetaryl-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, arylcarbonyl, aryloxycarbonyl, arylcarbonyloxy, arylaminocarbonyl, N-aryl-N-C_1–C_6-alkylaminocarbonyl, arylcarbonyl-N-C_1–C_6-alkylamino, aryloxycarbonylamino, hetarylcarbonyl, hetaryloxycarbonyl, hetarylcarbonyloxy, hetarylaminocarbonyl, N-hetaryl-N-C_1–C_6-alkylamino, each of which is unsubstituted or substituted by customary groups,

in the case where n is 2, 3 or 4, additionally an unsubstituted or substituted bridge bonded to two adjacent ring atoms, which contains three or four members from the group consisting of 3 or 4 carbon atoms, and 2 or 3 carbon atoms and 1 or 2 nitrogen, oxygen and/or sulfur atoms, it being possible for this bridge, together with the ring to which it is bonded, to form a partially unsaturated or aromatic radical;

X is a direct bond or CH_2, O or NR^a;

R^a is hydrogen, C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_{10}-cycloalkyl or C_5–C_{10}-cycloalkenyl;

R^1 is hydrogen,

C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_{10}-cycloalkyl, C_5–C_{10}-cycloalkenyl, C_1–C_{10}-alkylcarbonyl or C_1–C_{10}-alkoxycarbonyl, it being possible for these groups to be partially or completely halogenated and/or to carry one to three of the following radicals:

cyano, nitro, hydroxyl, amino, formyl, carboxyl, aminocarbonyl,

C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_1–C_6-alkylcarbonyl, C_1–C_6-alkoxycarbonyl, C_1–C_6-alkylcarbonyloxy, C_1–C_6-alkylaminocarbonyl, di-C_1–C_6-alkylaminocarbonyl, C_1–C_6-alkylcarbonylamino, C_1–C_6-alkoxycarbonylamino, C_1–C_6-alkylcarbonyl-N-C_1–C_6-alkylamino, and

CR^{iii}=NOR^{iv}, R^{iii} being hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or C_3–C_{12}-cycloalkyl and R^{iv} being C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_6-alkynyl or aryl-C_1–C_6-alkyl,

C_3–C_{12}-cycloalkyl, C_3–C_{12}-cycloalkoxy, C_3–C_{12}-cycloalkylthio, C_3–C_{12}-cycloalkylamino, C_3–C_{12}-cycloalkyl-N-C_1–C_6-alkylamino, each of which is unsubstituted or substituted by customary groups,

3- to 12-membered heterocyclyl, heterocyclyloxy, heterocyclylthio, heterocyclylamino or heterocyclyl-N-C_1–C_6-alkylamino, each of which is unsubstituted or substituted by customary groups,

aryl, aryloxy, arylthio, arylamino, aryl-N-C_1–C_6-alkylamino, aryl-C_1–C_6-alkoxy, aryl-C_1–C_6-alkylthio, aryl-C_1–C_6-alkylamino, aryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, hetaryl, hetaryloxy, hetarylthio, hetarylamino, hetaryl-N-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkoxy, hetaryl-C_1–C_6-alkylthio, hetaryl-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, arylcarbonyl, aryloxycarbonyl, arylcarbonyloxy, arylaminocarbonyl, N-aryl-N-C_1–C_6-alkylaminocarbonyl, arylcarbonyl-N-C_1–C_6-alkylamino, aryloxycarbonylamino, hetarylcarbonyl, hetaryloxycarbonyl, hetarylcarbonyloxy, hetarylaminocarbonyl, N-hetaryl-N-C_1–C_6-alkylaminocarbonyl, hetarylcarbonyl-N-C_1–C_6-alkylamino and hetaryloxycarbonylamino, each of which is unsubstituted or substituted by customary groups,

R^2 is C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, C_2–C_{10}-alkynyl, C_3–C_{10}-cycloalkyl or C_5–C_{10}-cycloalkenyl, or in the case where X is NR^a, additionally hydrogen;

R^3 is hydrogen, cyano, halogen, C_1–C_{10}alkyl, C_1–C_{10}haloalkyl, C_1–C_{10}alkoxy, C_1–C_{10}haloalkoxy, C_1–C_{10}alkylthio, C_1–C_4-haloalkylthio or C_3–C_{10}-cycloalkyl;

R^4 is a 6- to 10-membered mono- or bicyclic, heteroaromatic ring system selected from the group consisting of:

2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 3-pyridazinyl, 4-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, 2-pyrazinyl, 1,3,5-triazin-2-yl, 1,2,4-triazin-3-yl, indolyl, quinolinyl, isoquinolinyl and purinyl,

which is substituted by customary groups;

it being possible for the radicals substituted by customary groups to be:

partially or completely halogenated,

and/or one to four of the following radicals

cyano, nitro, hydroxyl, amino, carboxyl, aminocarbonyl,

C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_2–C_8-alkenyl, C_2–C_8-haloalkenyl, C_2–C_8-alkenyloxy, C_2–C_8-haloalkenyloxy, C_2–C_8-alkynyl, C_2–C_8-haloalkynyl, C_2–C_8-alkynyloxy, C_2–C_8-haloalkynyloxy, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_1–C_6-haloalkylthio, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_1–C_6-alkylcarbonyl, C_1–C_6-alkoxycarbonyl, C_1–C_6-alkylcarbonyloxy, C_1–C_6-alkylaminocarbonyl, di-C_1–C_6-alkylaminocarbonyl, C_1–C_6-alkylcarbonylamino, C_1–C_6-alkoxycarbonylamino and C_1–C_6-alkylcarbonyl-N-C_1–C_6-alkylamino,

and/or one to three of the following radicals

C_3–C_{12}-cycloalkyl, C_3–C_{12}-cycloalkoxy, C_3–C_{12}-cycloalkylthio, C_3–C_{12}-cycloalkylamino, C_3–C_{12}-Cycloalkyl-N-C_1–C_6-alkylamino,

3- to 12-membered heterocyclyl, heterocyclyloxy, heterocyclylthio, heterocyclylamino or heterocyclyl-N-C_1–C_6-alkylamino,

aryl, aryloxy, arylthio, arylamino, aryl-N-C_1–C_6-alkylamino, aryl-C_1–C_6-alkoxy, aryl-C_1–C_6-alkylthio, aryl-C_1–C_6-alkylamino, aryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, hetaryl, hetaryloxy, hetarylthio, hetarylamino, hetaryl-N-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkoxy, hetaryl-C_1–C_6-alkylthio, hetaryl-C_1–C_6-alkylamino, hetaryl-C_1–C_6-alkyl-N-C_1–C_6-alkylamino, arylcarbonyl, aryloxycarbonyl, arylcarbonyloxy, arylaminocarbonyl, N-aryl-N-C_1–C_6-alkylaminocarbonyl, arylcarbonyl-N-C_1–C_6-alkylamino, aryloxycarbonylamino, hetarylcarbonyl, hetaryloxycarbonyl, hetarylcarbonyloxy, hetarylaminocarbonyl, N-hetaryl-N-C_1–C_6-alkylaminocarbonyl, hetarylcarbonyl-N-C_1–C_6-alkylamino and hetaryloxycarbonylamino,

and or one or two of the following radicals

formyl or CR^{iii}=NOR^{iv}, R^{iii} being hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_3–C_{10}-cycloalkyl or C_2–C_6-alkynyl and R^{iv} being C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl and aryl-C_1–C_6-alkyl, or

a C_3–C_5-alkylene, C_3–C_5-alkenylene, oxy-C_2–C_4-alkylene, oxy-C_1–C_3-alkyleneoxy, oxy-C_2–C_4-alkenylene, oxy-C_2–C_4-alkenyleneoxy or butadienediyl group bonded to two adjacent C atoms, it being possible for these bridges in turn to be partially or completely halogenated and/or to carry one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4-alkylthio.

5,814,634

ALKYLENEDIAMINE DERIVATIVE ANTI-ULCER DRUG AND ANTIBACTERIAL DRUG

Chikao Nishino; Fumitaka Sato, both of Yokohama; Tomohiro Uetake, Tokyo; Hirotada Fukunishi, Yokohama, and Nao Kojima, Tokyo, all of Japan, assignors to Shiseido Co. Ltd., Tokyo, Japan

Filed Apr. 17, 1997, Ser. No. 842,891

Claims priority, application Japan, Apr. 18, 1996, 8-122195; Sep. 30, 1996, 8-278871; Jan. 6, 1997, 9-012056

Int. Cl.[6] A61K *31/535;* **C07D** *265/30;211/32*

U.S. Cl. 514—237.8 **26 Claims**

1. An alkylenediamine derivative or a salt thereof expressed by the following formula I:

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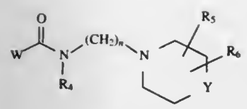
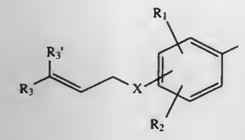


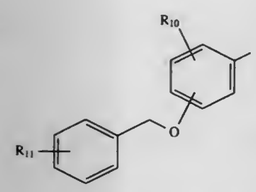
formula 1

(I)

wherein W represents a group expressed by the following formula 2 or formula 3;



formula 2



formula 3

wherein each of R_1 and R_2 represents hydrogen atom, a lower alkoxy group, an alkenyloxy group, or a halogen atom;

each of R_3 and R_3' represents methyl group, prenyl group, or geranyl group and when one of R_3 and R_3' is prenyl group or geranyl group, another is methyl group;

X represents oxygen atom or sulfur atom;

R_{10} represents a lower alkyl group; and

R_{11} represents a halogen atom; and wherein each of R_4, R_5, and R_6 represents hydrogen atom or a lower alkyl group;

Y represents a group expressed by —CH_2—, —O—, or —N(R_7)—, while R_7 represents a lower alkyl group, an aryl group, a carbamoyl lower alkyl group, an aralkyl group, or a heterocyclic group having 5 to 9 members; and

n represents an integer of 1 to 6.

5,814,635

CONCENTRATED INJECTION SOLUTION OF ALKALI METAL SALTS OF REDUCED FOLATES

Peter Buchs, Agra, and Fabrizio Marazza, Novaggio, both of Switzerland, assignors to Cerbios-Pharma S.A., Switzerland

Continuation of Ser. No. 388,431, Feb. 14, 1995, abandoned. This application Jul. 2, 1997, Ser. No. 886,942

Claims priority, application Switzerland, Feb. 14, 1994, 00432/94

Int. Cl.[6] A61K *31/505;* **C07D** *475/04*

U.S. Cl. 514—249 **22 Claims**

1. A concentrated, stable solution, comprising water and sodium-leucovorin, potassium-leucovorin, sodium-N(5)-methyl-5,6,7,8-tetrahydrofolic acid or potassium-N(5)-methyl-5,6,7,8-tetrahydrofolic acid, in the absence of tromethamine, monothioglycerol and benzyl alcohol, exhibiting no precipitate at 0°–5° C. for at least 6 months.

5,814,636

COMPOUNDS WITH PLATELET AGGREGATION INHIBITOR ACTIVITY

Kiyoaki Katano; Shokichi Ohuchi; Tomoaki Miura; Eiki Shitara; Masaro Shimizu; Kazue Yaegashi; Naoto Ohkura; Yasuko Isomura; Hiroyuki Iida; Midori Ishikawa; Kenji Asai, and Emiko Hatsushiba, all of Kanagawa-ken, Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo-to, Japan

PCT No. PCT/JP95/01419, § 371 Date Jul. 10, 1996, § 102(e) Date Jul. 10, 1996, PCT Pub. No. WO96/02503, PCT Pub. Date Feb. 1, 1996

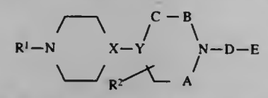
PCT Filed Jul. 17, 1995, Ser. No. 615,227

Claims priority, application Japan, Jul. 15, 1994, 6-163506; Jun. 2, 1995, 7-135514

Int. Cl.[6] A61K *31/495;31/445;* **C07D** *401/04;401/14*

U.S. Cl. 514—252 **10 Claims**

1. A compound represented by the following formula:



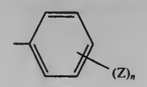
(I)

wherein A, B and C represent independently CH_2 or C=O;

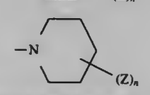
X and Y are different from each other, and each of them is CH or N;

D is —$(CH_2)_k$— or —$(CH_2)_m$—CO— where k is an integer of 1 to 4; and m is an integer of 0 to 3;

E is the following group (II) or (III):



(II)



(III)

wherein n is an integer of 1 to 3; and Z is —W—$(CH_2)_p$—$COOR^3$ wherein W is —O— or a bond; p is an integer of 1 to 4; and R^3 is hydrogen, lower alkyl or an ester residue selected from the group consisting of pivaloyloxymethyl, 1-(cyclohexyloxycarbonyloxy)ethyl and (5-methyl- 2-oxo-1,3-dioxol-4-yl)methyl;

R^1 is hydrogen; lower alkyl in which at least one hydrogen atom may be substituted by hydroxyl, halogen, amino, lower alkylamino, or lower-alkyl-substituted-2-oxodioxol-4-yl group; or lower alkyl in which two hydrogen atoms may be substituted by an imino group;

R^2 is hydrogen atom; lower alkyl in which at least one hydrogen atom may be substituted by hydroxyl, halogen, amino, carboxyl, lower alkoxy, lower alkylamino or lower alkoxycarbonyl; phenyl in which at least one hydrogen atom may be substituted by hydroxyl, halogen, amino, carboxyl, lower alkoxy, lower alkylamino, lower alkoxycarbonyl or halo-lower alkyl; or phenyl-lower alkyl in which at least one hydrogen atom of the phenyl group may be substituted by hydroxyl, halogen, amino, carboxyl, lower alkoxy, lower alkylamino, lower alkoxycarbonyl or halo-lower alkyl; or a pharmaceutically acceptable salt or solvate thereof.

5,814,637

Patent Not Issued For This Number

5,814,638

OPHTHALMIC FORMULATION FOR TREATING MYOPIA COMPRISING DOPAMINE AGONIST AND CYCLODEXTRIN

Yong-Hee Lee; Yun-Jeong Choi; Mi-Kyeong Seo; Chang-Ho Lee, and In-Chull Kim, all of Daejeon, Rep. of Korea, assignors to LG Chemical Ltd., Seoul, Rep. of Korea

Filed Oct. 2, 1996, Ser. No. 724,808

Int. Cl.[6] A61K *31/495*

U.S. Cl. 514—255 **8 Claims**

1. An ophthalmic formulation for treating myopia, which comprises bromocriptine and cyclodextrin or its derivative in combination with a pharmaceutically acceptable carrier.

5,814,639

METHOD FOR THE SYNTHESIS, COMPOSITIONS AND USE OF 2'-DEOXY-5-FLUORO-3'-THIACYTIDINE AND RELATED COMPOUNDS

Dennis C. Liotta, Stone Mountain; Raymond F. Schinazi, Decatur, both of Ga., and Woo-Baeg Choi, North Brunswick, N.J., assignors to Emory University, Atlanta, Ga.

Division of Ser. No. 659,760, Feb. 22, 1991, Pat. No. 5,210,085, which is a continuation-in-part of Ser. No. 473,318, Feb. 1, 1990, Pat. No. 5,204,466. This application Feb. 16, 1993, Ser. No. 17,820

Int. Cl.[6] A61K *31/505;* **C07D** *239/02*

U.S. Cl. 514—274 **2 Claims**

1. β-2'-Deoxy-5-fluoro-3'-thiacytidine.

5,814,640

METHOD OF TREATING GASTROINTESTINAL MALIGNANCIES

Scott Wadler, Larchmont, N.Y., assignor to Montefiore Medical Center, Bronx, N.Y.

Continuation of Ser. No. 317,377, Oct. 4, 1994, abandoned. This application Apr. 2, 1997, Ser. No. 831,925

Int. Cl.[6] A61K *31/505;38/21*

U.S. Cl. 514—274 **3 Claims**

1. A method for the treatment of a malignancy sensitive to a treatment regimen which comprises administering by injection to a host afflicted with said malignancy 5-fluorouracil at a dose of 600–1000 mg/m²/day followed by the administration of from 2–40 million international units of beta interferon 3 to 7 times weekly commencing on the first day that 5-fluorouracil therapy is instituted.

5,814,641

Patent Not Issued For This Number

5,814,642

TETRACYCLIC CONDENSED HETEROCYCLIC COMPOUNDS THEIR PRODUCTION, AND USE

Eiichi Goto, Osaka; Yuji Ishihara, and Masaomi Miyamoto, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

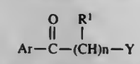
Division of Ser. No. 330,133, Oct. 25, 1994, Pat. No. 5,620,973. This application Jul. 30, 1996, Ser. No. 681,911

Claims priority, application Japan, Nov. 30, 1993, 5-299799; Mar. 25, 1994, 6-055984

Int. Cl.[6] C07D *221/18;401/02;* **A61K** *31/44;31/395*

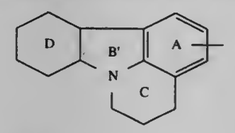
U.S. Cl. 514—289 **15 Claims**

1. A compound of the formula:



(I)

wherein n represents a whole number of 1 through 10; R^1 represents a hydrogen atom or a hydrocarbon group which may be substituted and may be different from one another in the repetition of n; Y represents an unsubstituted or substituted amino or nitrogen-containing saturated heterocyclic group which may be substituted; Ar is group of the formula, which may be substituted:



or a salt thereof.

5,814,643

SULFONAMIDE FIBRINOGEN RECEPTOR ANTAGONISTS

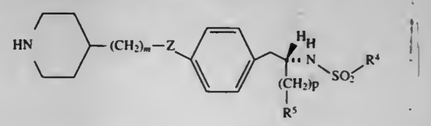
Mark E. Duggan, Narberth; Melissa S. Egbertson, Ambler; Wasyl Halczenko, Hatfield; George D. Hartman, Lansdale, and William L. Laswell, Perkasie, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 505,417, Jul. 21, 1995, Pat. No. 5,658,929, which is a continuation-in-part of Ser. No. 750,647, Aug. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 589,130, Sep. 27, 1990, abandoned. This application May 22, 1997, Ser. No. 861,545

Int. Cl.[6] A61K *31/445*

U.S. Cl. 514—317 **12 Claims**

1. A method for inhibiting platelet aggregation in a mammal resulting from interaction of platelets with artificial surfaces, which comprises treating the mammal with a pharmacologically effective amount of a compound of the structural formula



and the pharmaceutically acceptable salts thereof, wherein

R^4 is

aryl,

C_{1-10} alkyl, or

C_{4-10} aralkyl,

wherein aryl is phenyl, pypridyl, thienyl, tetrazole or oxazole;

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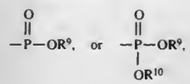
R^5 is

wherein

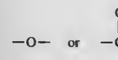
R^8 is hydroxy or C_{1-10} alkyloxy,



wherein

R^9 and R^{10} are selected from the group consisting of hydrogen, C_{1-10} alkyl and phenyl C_{1-4} alkyl;

Z is



p is zero or one; and

m is an integer from two to six.

5,814,644

INDOLE DERIVATIVES AS DOPAMINE D4 ANTAGONISTS

Janusz Jozef Kulagowski, Bishops Stortford, United Kingdom; Paul David Leeson, Monmouth Junction, N.J., and Mark Peter Ridgill, Watton-At-Stone, United Kingdom, assignors to Merck Sharp & Dohme, Ltd., Hoddesdon, England

PCT No. PCT/GB94/00760, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO94/24105, PCT Pub. Date Oct. 27, 1994

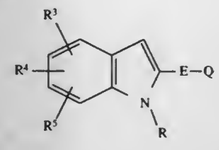
PCT Filed Apr. 8, 1994, Ser. No. 532,780

Claims priority, application United Kingdom, Apr. 15, 1993, 9307831; Aug. 5, 1993, 9316274

Int. Cl.[6] A61K *31/44;31/445;* **C07D** *401/06;403/06*

U.S. Cl. 514—323 **13 Claims**

1. A method for the treatment of psychotic disorders comprising the step of administering to a patient in need thereof an effective amount of a compound of formula I, or a pharmaceutically acceptable salt thereof:

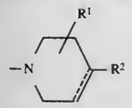


wherein

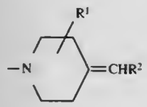
E represents $—CH_2—$;

R represents hydrogen or C_{1-6} alkyl;

Q represents a moiety of formula Qa, Qb,



(Qa)



(Qb)

in which the broken line represents an optional chemical bond;

R^1 represents hydrogen;

R^2 represents methyl, ethyl, n-propyl, isopropyl, phenyl, chlorophenyl, ethylphenyl, methoxyphenyl, nitrophenyl, benzyl, chlorobenzyl, phenethyl, phenylpropyl or benzyloxy;

R^3, R^4 and R^5 independently represent hydrogen, hydrocarbon, a heterocyclic group, halogen, cyano, trifluoromethyl, nitro, $—OR^a$, $—SR^a$, $—SOR^a$, $—SO_2R^a$, $—SO_2NR^aR^b$, $—NR^aR^b$, $—NR^aCOR^b$, $—NR^aCO_2R^b$, $—COR^a$, $—CO_2R^a$ or $—CONR^aR^b$; wherein hydrocarbon is selected from the group consisting of: C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl(C_{1-6})alkyl, aryl, aryl(C_{1-6})alkyl, aryl(C_{2-6})alkenyl and aryl(C_{2-6})alkynyl; and heterocyclic group is selected from the group consisting of: C_{3-7} heterocycloalkyl, C_{3-7} heterocycloalkyl(C_{1-6})alkyl, heteroaryl, heteroaryl(C_{1-6})alkyl, heteroaryl(C_{2-6})alkenyl and heteroaryl(C_{2-6})alkynyl groups;

Z represents $—CH_2—$ or $—CH_2CH_2—$;

R^6 represents hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, aryl, aryl(C_{1-6})alkyl or halogen; and

R^a and R^b independently represent hydrogen, hydrocarbon or a heterocyclic group, as defined above.

5,814,645

ARYLOR HETARYL SUBSTITUTED NITROGEN HETEROCYCLES AND THEIR USE AS PESTICIDES

Johannes Kanellakopulos, Dormagen; Rainer Fuchs, Wuppertal; Johannes Rudolf Jansen, Monheim; Michael Schindler, Bergisch Gladbach; Christoph Erdelen, Leichlingen; Wolfgang Leicht, Leverkusen; Ulrike Wachendorff-Neumann, Bonn, and Andreas Turberg, Erkrath, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

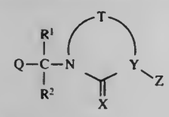
Continuation of Ser. No. 522,351, Sep. 15, 1995. This application Aug. 18, 1997, Ser. No. 916,719

Claims priority, application Germany, Mar. 24, 1993, 43 09 552.6

Int. Cl.[6] A61K *31/44;* **C07D** *401/06*

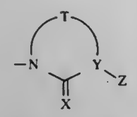
U.S. Cl. 514—332 **9 Claims**

1. Substituted nitrogen heterocycles of the formula (I)

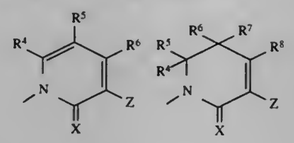


(I)

in which the group



represents one of the following meanings:



where

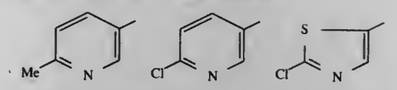
R^1 represents hydrogen, methyl or ethyl,

R^2 represents hydrogen,

X represents oxygen, sulphur or NR^3,

Z represents a cyano or nitro group,

Q assumes one of the following meanings



R^3 represents hydrogen or methyl, and

R^4, R^5, R^6, R^7 and R^8 independently of one another represent hydrogen, fluorine, chlorine, bromine, C_{1-2}-alkyl, C_{1-2}-alkoxy and phenyl which is optionally mono- or polysubstituted by fluorine, chlorine, bromine, C_{1-2}-alkyl, trifluoromethyl, C_{1-2}-alkoxy or trifluoromethoxy.

5,814,646

INHIBITORS OF AMYLOID BETA-PROTEIN PRODUCTION

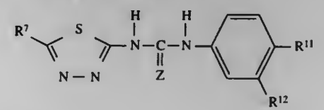
Lawrence J. Heinz, Pittsboro; Jill A. Panetta, Zionsville; Michael L. Phillips, Indianapolis; Jon K. Reel, Carmel; John K. Shadle, Fishers; Richard L. Simon, and Celia A. Whitesitt, both of Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 2, 1995, Ser. No. 398,188

Int. Cl.[6] A61K *31/415;31/425;* **C07D** *285/135*

U.S. Cl. 514—363 **6 Claims**

1. A method of inhibiting the production of Aβ peptide in a biological system, which comprises administering an effective amount of a compound of general formula



Ia

in which

Z is O or S;

R^{11} is a halogen atom;

R^{12} is a halogen atom or a trifluoromethyl group; and

R^7 is hydrogen, (1–8C)alkyl, (1–8C)haloalkyl, (1–8C) alkylthio, (1–8C)alkoxy or halogen;

or a pharmaceutically acceptable salt thereof.

5,814,647

USE OF TROGLITAZONE AND RELATED COMPOUNDS FOR THE TREATMENT OF THE CLIMACTERIC SYMPTOMS

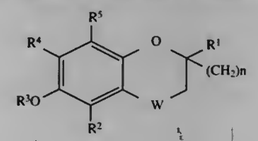
Randall J. Urban, Friendswood, and Allan Green, Galveston, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Mar. 4, 1997, Ser. No. 811,419

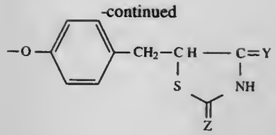
Int. Cl.[6] A61K *31/44;31/425;31/41*

U.S. Cl. 514—369 **24 Claims**

1. A method of treating climacteric symptoms in a climacteric woman patient, comprising administering said patient a therapeutically effective amount of a compound of Formula I:



-continued



wherein R^1 and R^2 are the same or different and each represents a hydrogen atom or a C_1–C_5 alkyl group;

R^3 represents a hydrogen atom, a C_1–C_6 aliphatic acyl group, an alicyclic acyl group, an aromatic acyl group, a heterocyclic acyl group, an araliphatic acyl group, a (C_1–C_6 alkoxy)carbonyl group, or an aralkyloxycarbonyl group;

R^4 and R^5 are the same or different and each represents a hydrogen atom, a C_1–C_5 alkyl group or a C_1–C_5 alkoxy group, or R^4 and R^5 together represent a C_1–C_4 alkylenedioxy group;

n is 1, 2 or 3;

W represents the $—CH_2—$, >CO, or CH—OR^6 group (in which R^6 represents any one of the atoms or groups defined for R^3 and may be the same as or different from R^3); and

Y and Z are the same or different and each represents an oxygen atom or an imino (=NH) group;

and pharmaceutically acceptable salts thereof.

5,814,648

N-HYDROXYUREAS AS ANTIINFLAMMATORY AGENTS

Akemi Ando, Taketoyo-cho, and Rodney William Stevens, Handa, both of Japan, assignors to Pfizer Inc., New York, N.Y.

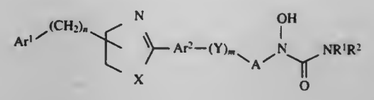
PCT No. PCT/JP95/01127, § 371 Date Nov. 5, 1997, § 102(e) Date Nov. 5, 1997, PCT Pub. No. WO96/40659, PCT Pub. Date Dec. 19, 1996

PCT Filed Jun. 7, 1995, Ser. No. 945,671

Int. Cl.[6] A61K *31/42;31/425;31/44;* **C07D** *263/14*

U.S. Cl. 514—374 **11 Claims**

1. A compound of the following chemical formula:



or a pharmaceutically acceptable salt or stereoisomer thereof, wherein

A is C_1–C_4 alkylene, CH(R), CH(R)CH_2 or CH(R)CH_2CH_2, in which R is methyl or ethyl;

m is one and n is zero or one;

R^1 and R^2 are each hydrogen, C_1–C_4 alkyl or C_2–C_6 alkenyl;

X is O or S;

Y is O, S, CH=CH or C≡C;

Ar^1 is phenyl or phenyl mono-substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 halo-substituted alkyl or C_1–C_4 halo-substituted alkoxy; and

Ar^2 is phenylene, pyridylene or phenylene mono- or di-substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1C_4 halo-substituted alkyl or C_1–C_4 halo-substituted alkoxy.

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5,814,649

PREVENTIVE AND REMEDY FOR TYPE 1 ALLERGIC DISEASES

Yukio Amano, Hidaka; Yuko Mizushima, Tokyo, and Kenji Ogata, Otawara, all of Japan, assignors to Hoechst Pharmaceuticals & Chemicals K.K., Tokyo, Japan

PCT No. PCT/JP95/02027, § 371 Date Jun. 6, 1997, § 102(e) Date Jun. 6, 1997, PCT Pub. No. WO96/11682, PCT Pub. Date Apr. 25, 1996

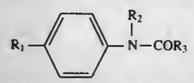
PCT Filed Oct. 4, 1995, Ser. No. 817,241

Claims priority, application Japan, Oct. 17, 1994, 6-250293

Int. Cl.[6] A61K *31/42;31/16*

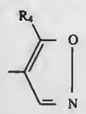
U.S. Cl. 514—380 **8 Claims**

1. A method for prophylaxis or treatment of Type I allergic diseases which comprises administering to a human being or a mammal in need of said prophylaxis or treatment, an anilide compound represented by the general formula (I)



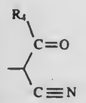
(I)

wherein R_1 is a trifluoromethyl group, a halogen atom or a cyano group, R_2 is a hydrogen atom or a straight or branched C_1–C_4 alkyl group and R_3 is a group of the formula (II) or (III)



(II)

or



(III)

wherein R_4 is a straight or branched C_1–C_4 alkyl group, a straight or branched C_2–C_6 alkenyl group, a straight or branched C_2–C_6 alkynyl group or a C_3–C_6 cycloalkyl group or a stereoisomer thereof or a physiologically acceptable salt thereof.

5,814,650

BIOTIN AMIDES ABLE TO CONTROL GLUCIDIC METABOLISMS UNDER DYSMETABOLIC CONDITIONS AND RELATIVE THERAPEUTICAL COMPOSITIONS

Francesco Della Valle; Silvana Lorenzi, both of Padova; Gabriele Marcolongo, Carrara San Giorgio, and Lauro Galzigna, Padova, all of Italy, assignors to Lifegroup S.p.A., Rome, Italy

Continuation of Ser. No. 280,321, Jul. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 127,339, Sep. 28, 1993, abandoned. This application Mar. 28, 1997, Ser. No. 825,458

Claims priority, application Italy, Sep. 28, 1992, MI92A2232 U

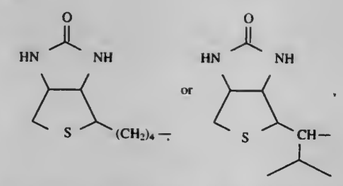
Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—387 **15 Claims**

5. A therapeutic method for the treatment of insulin independent diabetes or insulin dependent diabetes and for the treatment of diabetic peripheral neuropathies, comprising: administering a therapeutically effective amount of at least an amide of α or β biotin of formula (I):

wherein

W is



R is a bivalent radical of from 1 to 20 carbon atoms having the meanings defined in one of the following classes:

A) a linear or branched alkylene radical, optionally substituted in the alkylene chain with at least one substituent selected from the group consisting of:

$-COOH$, $-NH_2$, $-NH-\underset{\underset{NHR'}{|}}{C}=NH$,

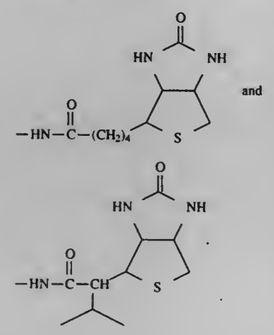
$-H$, $-SH$, $-CO-$, $-OH$

and wherein R' is methyl or —H;

B) a cycloalkylene of from 3 to 7 carbon atoms;

C) an arylene or an arylalkylene radical optionally substituted on the aromatic ring with at least one $—NO_2$ group;

and X is selected from the group consisting of —H, —OH, —COOH,



5,814,651

CATECHOL DIETHERS AS SELECTIVE PDE^{IV} INHIBITORS

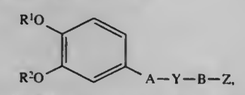
Allen Jacob Duplantier, Ledyard; James Frederick Eggler, Stonington; Anthony Marfat, Mystic, and Hiroko Masamune, Noank, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 142,328, Nov. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,408, Dec. 2, 1992, abandoned. This application Jun. 10, 1997, Ser. No. 872,686

Int. Cl.[6] A61K *31/415;* **C07D** *235/06*

U.S. Cl. 514—394 **9 Claims**

1. A compound of the formula



(I)

the racemic-diastereomeric mixtures and optical isomers of said compounds and the pharmaceutically acceptable salts thereof wherein

R^1 is selected from the group consisting of methyl, ethyl, difluoromethyl and triifuoromethyl;

R^2 is selected from the group consisting of (C_1–C_6)alkyl, alkoxyalkl having 3 to 7 carbons in the alkoxy portion and 2 to 4 carbons in the alkyl portion, phenoxyalkyl having 2 to 6 carbons in the alkyl portion, (C_3–C_7)cycloalkyl, (C_6–C_9)polycycloalkyl, phenylalkyl having 1 to 8 carbons in the alkyl portion, phenylaminoalkyl having 2 to 6 carbons in the alkyl portion and the amino may be optionally substituted with (C_1–C_4) alkyl and indanyl,

where the alkyl portion of said alkyl, phenoxyalkyl, cycloalkyl, polycycloalkyl,

phenylalkyl and indanyl may optionaliy be substituted with one or more fluorine atoms, —OH or (C_1–C_4)alkoxy,

and the aryl portion of said phenylalkyl, phenoxyalkyl and indanyl may optionally be substituted with (C_1–C_4)alkyl, (C_1–C_4)alkoxy or halogen;

A and B are independently selected from the group consisting of a covalent bond, optionally substituted (C_1–C_5)alkylene, optionally substituted (C_2–C_5)alkenyl and optionally substituted phenylene,

where said optionally substituted alkylene may be monosubstituted and each substituent is selected from the group consisting of oxo, (C_1–C_4)alkoxy, CO_2R^6 and hydroxy,

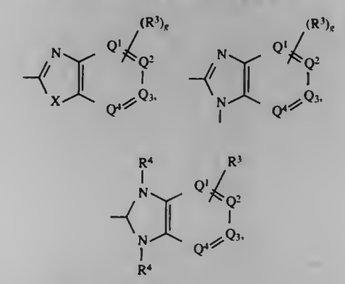
said optionally substituted alkenyl may be monosubstituted with (C_1–C_4)alkoxy or CO_2R^5, and

said optionally substituted phenylene may be monosubstituted with (C_1–C_4)alkoxy, CO_2R^6 or hydroxy,

wherein R^6 is hydrogen or (C_1–C_4)alkyl;

Y is selected from the group consisting of a covalent bond, O, NR^6 and S wherein R^6 is as defined above;

Z is selected from the group consisting of



where Q^1, Q^2, Q^3, and Q^4 are CH

X is NR^4,

g is an integer from 1 to 4;

each R^3 is independently selected from the group consisting of hydrogen, halogen, (C_1–C_6)alkyl, $CH(R^7)CO_2R^4$, (C_1–C_6)alkoxy, CO_2R^4, $CONR^4R^5$, CONHOH, $CH_2NR^4R^5$, NR^4R^5, nitro, hydroxy, CN, SO_3H, phenylalkyl having 1 to 4 carbons in the alkyl portion,

$SO_2NR^4R^5$, $N(SO_2R^8)_2$ and $NHSO_2R^8$,

where R^4 for each occurrence is independently selected from the group consisting of hydrogen, (C_1–C_6)alkyl, phenyl optionally substituted with (C_1–C_4)alkyl or halogen, $CH(R^7)CO_2R^6$, (C_3–C_7)cycloalkyl, phenylalkyl having 1 to 4 carbons in the alkyl portion and dialkylaminoalkyl having a total of 5 carbons in the dialkylamino portion and having 2 to 5 carbons in the alkyl portion where R^5 is as defined above,

R^5 for each occurrence is independently selected from the group consisting of hydrogen, (C_1–C_6)alkyl, (C_3–C_7)cycloalkyl, phenylalkyl having 1 to 4 carbons in the alkyl portion, phenyl, pyridyl, pyrimidyl, thiazolyl and oxazolyl,

or R^4 and R^5 are taken together with the nitrogen to which they are attached and form an optionally substituted saturated or unsaturated 5- or 6-membered ring, a saturated or unsaturated 6-membered heterocyclic ring containing two heteroatoms, or a quinoline ring optionally substituted with fluoro,

where said optionally substituted saturated or unsaturated 5- or 6-membered ring may be mono- or di-substituted and each substituent is independently selected from the group consisting of alkyl having 1 to 4 carbons, CO_2R^7 wherein R^7 is as defined below, $CONH_2$, $CON(CH_3)_2$, oxo, hydroxy, NH_2 and $N(CH_3)_2$, and said saturated or unsaturated 6-membered heterocyclic ring containing two heteroatoms has the second heteroatom selected from the group consisting of O, S, NH, NCH_3, $NCOCH_3$ and NCH_2Ph;

R^7 for each occurrence is independently selected from the group consisting of hydrogen and (C_1–C_4)alkyl;

and R^8 is selected from the group consisting of (C_1–C_6)alkyl, (C_3–C_7)cycloalkyl, phenyl and phenyalkyl having 1 to 4 carbons in the alkyl portion.

5,814,652

PESTICIDAL 5-AMINO-4-ETHYLSULFINYL-1-ARYLPYRAZOLES

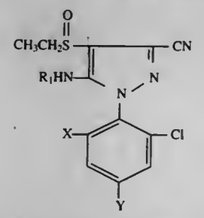
Tai-Teh Wu, Chapel Hill, N.C., assignor to Rhone-Poulenc Inc., Research Triangle Park, N.C.

Filed Dec. 17, 1996, Ser. No. 768,120

Int. Cl.[6] A01N *43/56;* **C07D** *231/44*

U.S. Cl. 514—404 **25 Claims**

1. A compound having the formula:



(I)

wherein X is chlorine or bromine, Y is trifluoromethyl or trifluoromethoxy and R_1 is hydrogen, methyl or ethyl.

5,814,653

PHARMACEUTICAL METHOD USING 6-SUBSTITUTED-1, 2, 3, 4-TETRAHYDRO-9H-CARBAZOLES AND 7-SUBSTITUTED-10H-CYCLOHEPTA (7, 6-B) INDOLES

Michael Edward Flaugh; Anton Daniel Kiefer, Jr.; Clint Duane Walker, and Yao-Chang Xu, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 671,465, Jun. 27, 1996, Pat. No. 5,708,187. This application Dec. 17, 1997, Ser. No. 992,320

Int. Cl.[6] A61K *31/40*

U.S. Cl. 514—411 **3 Claims**

1. A method for increasing activation of the 5-HT_{1F} receptor in mammals comprising the administration to a mammal in need of such activation an effective dose of a compound of formula:

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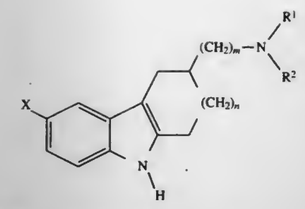


II

wherein:

R^1 and R^2 are independently hydrogen, C_1–C_4 alkyl, or —CH_2CH_2-Aryl where Aryl is phenyl, phenyl monosubstituted with halo, or 1-(C_1–C_6 alkyl)pyrazol-4-yl;

X is —NHC(O)R^3, —NHC(Y)NHR^4, —NHC(O)OR^5, or —NHSO_2R^7;

R^3 is C_2–C_6 alkenyl, C_3–C_8 cycloalkyl, phenyl, substituted phenyl, naphthyl, (C_1–C_4 alkylene) phenyl, thienylmethyl, or a heterocycle;

R^4 is C_1–C_6 alkyl, phenyl, or phenyl disubstituted with halo;

R^5 is C_1–C_6 alkyl, C_2–C_6 alkenyl, benzyl or phenyl monosubstituted with halo;

R^6 is C_1–C_6 alkyl, phenyl, or phenyl monosubstituted with halo or C_1–C_4 alkoxy;

R^7 is dimethylamino, phenyl or phenyl monosubstituted with halo or C_1–C_4 alkyl;

m is 0 or 1;

n is 1 or 2; and

Y is S or O; and pharmaceutically acceptable salts and hydrates thereof.

5,814,654

SUBSTITUTED GUANIDINE DERIVATIVES

Masahumi Kitano, Takatsuki; Kazuhiro Nakano, Nishinomiya, and Naohito Ohashi, Takatsuki, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

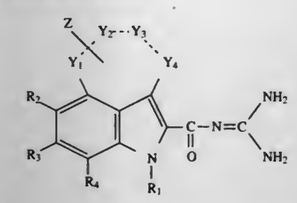
Filed Apr. 24, 1997, Ser. No. 847,363

Claims priority, application Japan, Apr. 24, 1996, 8-128973

Int. Cl.[6] A61K *31/40;* **C07D** *209/90*

U.S. Cl. 514—411 **15 Claims**

1. A compound of formula (1):

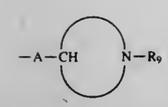


(1)

wherein

R_1 is a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, a cycloalkyl group, a cycloalkenyl group, a saturated heterocyclic group, an aromatic group, —OR_5, an acyl aromatic group, —Q—R_a;

R_2, R_3 and R_4 are independently a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, a cycloalkyl group, a cycloalkenyl group, a saturated heterocyclic group, a halogen atom, a nitro group, a carboxyl group, an alkoxycarbonyl group, an aromatic group, —OR_5, —N(R_6)R_7, —CON(R_6)R_7, —SO_2N(R_6)R_7, —S(O)$_n$$R_8$, an acyl group, —Q—$R_a$ or



wherein the ring is a 3- to 8-membered saturated heterocyclic group composed of a nitrogen atom and carbon atoms;

Y_1, Y_2, Y_3 and Y_4 are as follows: (1) one of them is a methylene group, a carbonyl group, or —C(=C(R_{11})(R_{12}))—, two others are independently a methylene group, and the remaining one is a single bond or a methylene group, or (2) any adjacent two members of a group consisting of Y_1, Y_2, Y_3 and Y_4 are taken together to represent a vinylene group, another is a methylene group, a carbonyl group, or —C(=C(R_{11})(R_{12}))—, and the remaining one is a single bond or a methylene group;

Z is a substituent which may be substituted for at least on hydrogen atom bonded to any of the carbon atoms constituting the ring formed by Y_1, Y_2, Y_3 and Y_4, namely, Z may be absent, or one or more Zs may be present and are independently a substituent selected from the group consisting of unsubstitued alkyl groups, substituted alkyl groups, alkenyl groups, alkynyl groups, cycloalkyl groups, cycloalkenyl groups, saturated heterocyclic groups, halogen atoms, carboxyl group, alkoxycarbonyl groups, aromatic groups, —OR_5, —N(R_6)R_7, —CON(R_6)R_7, —S(O)$_n$$R_8$, acyl groups, and —Q—$R_a$;

A is an oxygen atom, —S(O)$_n$— or —N(R_{10})—;

Q is an substituted or unsubstituted lower alkylene group;

R_a is a substituted or unsubstituted vinyl group, or a substituted or unsubstituted ethynyl group;

R_5 is a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, a cycloalkyl group, a cycloalkenyl group, a saturated heterocyclic group or an aromatic group;

R_6 and R_7 are independently a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, a cycloalkyl group, a cycloalkenyl group, a saturated heterocyclic group, an aromatic group, an acyl group or —Q—R_a, or R_6 and R_7, when taken together with the nitrogen atom to which they are bonded, form a saturated 5- to 7-membered cyclic amino group which may contain an oxygen atom or sulfur atom in the ring or form a 5- to 7-membered cyclic group containing 1 to 3 nitrogen atoms, and may be substituted by one or two unsubstituted alkyl groups, substituted alkyl groups, hydroxyl groups or —OR_5 groups;

R_8 is an unsubstituted alkyl group, a substituted alkyl group or an aromatic group;

R_9 is a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, an acyl group or —Q—R_a;

R_{10} is a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, a cycloalkyl group, a saturated heterocyclic group, an aromatic group, an acyl group or —Q—R_a;

R_{11} and R_{12} are independently a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, an alkenyl group, an alkynyl group, a cycloalkyl group, a cycloalkenyl group, a saturated heterocyclic group, a halogen atom, a carboxyl group, an alkoxycarbonyl group, an aromatic group, —OR_5, —N(R_6)R_7, —CON(R_6)R_7, —S(O)$_n$$R_8$, an acyl group or —Q—$R_a$; and

n is 0, 1 or 2,

or a pharmaceutically acceptable acid addition salt thereof, wherein:

said alkyl groups are, independently, linear or branched alkyl groups of 8 or less carbon atoms;

said cycloalkyl groups are, independently, 3- to 8-membered cycloalkyl groups and are unsubstituted or are substituted with 1 to 4 groups selected from the group consisting of unsubstituted alkyl groups, substituted alkyl groups, hydroxyl groups and —OR_5;

said cycloalkenyl groups are, independently, 3- to 8-membered cycloalkenyl groups and are unsubstituted or are substituted with 1 or 4 selected from the group consisting of unsubstituted alkyl groups, substituted alkyl groups, hydroxyl groups and —OR_5;

said saturated heterocyclic groups are, independently, 3- to 8-membered saturated heterocyclic groups having an oxygen atom or a sulfur atom and are unsubstituted or are substituted with 1 or 4 selected from the group consisting of unsubstituted alkyl groups, substituted alkyl groups, hydroxyl groups and —OR_5;

said alkoxycarbonyl groups are, independently, linear or branched alkoxycarbonyl groups of 6 or less carbon atoms;

said aromatic groups are, independently, substituted or unsubstituted aryl groups or substituted or unsubstituted heteroaryl groups;

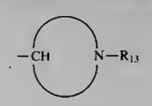
said aryl groups are, independently, aryl groups of 10 or less carbon atoms;

said heteroaryl groups are, independently, 5- or 6-membered heteroaryl groups containing 1 to 4 nitrogen atoms or 5- or 6-membered heteroaryl groups containing 0 to 2 nitrogen atoms and an oxygen atom or a sulfur atom;

said substituents of the substituted aryl groups and the substituted heteroaryl groups are, independently, selected from the group consisting of unsubstituted alkyl group, substituted alkyl group, halogen atom, nitro group, alkoxycarbonyl group, carboxyl group, —OR_5, —NR_6R_7, CONR_6R_7, —SO_2NR_6R_7 and —S(O)$_n$$R_8$.

said alkoxy groups are, independently, linear or branched alkoxy groups or 6 or less carbon atoms;

said substituents of the substituted alkyl groups are, independently, selected from the group consisting of nalogen atom, hydroxyl group, alkoxy group, cycloalkyl group, cyano group, carboxyl group, alkoxy-carbonyl group, aromatic group, acyl group, —CONR_pR_q wherein R_p and R_q are independently a hydrogen atom or an alkyl group, or R_p and R_q, when taken together with the nitrogen atom to which they are bonded, form a saturaated 5-to 7-membered cyclic amino group which may contain an oxygen atom or a sulfur atom in the ring or form a 5- to 7-membered cyclic group containing 1 to 3 nitrogen atoms, and may be substituted by one or two unsubstituted alkyl groups, substituted alkyl groups, hydroxyl groups or —OR_5 groups, —NR_6R_7, and the formula:



wherein R_{13} is a hydrogen atom, an unsubstitued alkyl group or a substituted alkyl group and the ring is a 3- to 8-membered saturated heterocyclic ring containing a nitrogen atom;

said lower alkylene groups are, independently, alkylene groups of 6 or less carbon atoms;

said substituent on the lower alkylene group for Q and the substituent on the vinyl or ethynyl group for R_a are, independently, selected from the group consisting of unsubstituted alkyl group, substituted alkyl group, cycloalkyl group, cycloalkenyl group, saturated heterocyclic group, carboxyl group, alkoxycarbonyl group, aromatic group, and —CON(R_6)R_7,

said acyl groups are, independently, formyl groups, alkanoyl groups of 2 to 6 carbon atoms, cycloalkanecarbonyl groups of 3 to 6 carbon atoms, cycloakenecarbonyl groups of 3 to 6 carbon atoms, aroyl groups of 6 to 10 carbon atoms, saturated heterocyclic ring-carbonyl groups having a 5- or 6-membered saturated heterocyclic ring containing one or two heteroatoms selected from the group consisting of nitrogen atoms, oxygen atom and sulfur atoms, or heteroaromatic acyl groups have a 5- or 6-membered heteoaromatic ring containing one or two heteroatoms selected from the group consisting of nitrogen atom, oxygen atom and sulfur atom,

said alkenyl groups are, independently, alkenyl groups of 6 or less carbon atoms; and

said alkynyl groups are, independently, alkynyl group of 6 or less carbon atoms.

5,814,655

NON-STEROIDAL OPHTHALMIC MIXTURES

Rajesh Patel, Redwood City; Lyle M. Bowman, Pleasanton, and Peng Shen, Hayward, all of Calif., assignors to InSite Vision Incorporated, Alameda, Calif.

Filed Nov. 14, 1996, Ser. No. 749,020

Int. Cl.[6] A61K *31/40;31/195;31/19*

U.S. Cl. 514—413 **28 Claims**

1. A composition for topical ophthalmic application comprising: an aqueous mixture of a non-steroidal, pharmaceutical agent, said agent being a weak acid having a pKa in the range of about 3.5 to about 5.0, said composition being formulated with a pH less than about 6.5 and a concentration of agent which maintains at least a therapeutic amount of the agent of the formulation in suspension and a therapeutic amount of the agent of the formulation in solution.

5,814,656

SELECTIVE PREVENTION OF ORGAN INJURY IS SEPSIS AND SHOCK USING SELECTIVE RELEASE OF NITRIC OXIDE VULNERABLE ORGANS

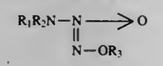
Joseph E. Saavedra, Thurmont, and Larry K. Keefer, Bethesda, both of Md., assignors to The United States Of America, as represented by the Department Of Health And Human Services, Washington, D.C.

Division of Ser. No. 509,558, Jul. 31, 1995, Pat. No. 5,714,511. This application Oct. 2, 1997, Ser. No. 942,896

Int. Cl.[6] A61K *31/40;31/535;31/495;31/445*

U.S. Cl. 514—426 **9 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are independently chosen from C_{1-12} straight chain alkyl, C_{1-12} alkoxy or acyloxy substituted straight chain alkyl, C_{2-12} hydroxy or halo substituted straight chain alkyl, C_{3-12} branched chain alkyl, C_{3-12} hydroxy , halo, alkoxy, or acyloxy substituted branched chain alkyl, C_{3-12} straight chain olefinic and C_{3-12} branched chain olefinic which are unsubstituted or substituted with hydroxy, alkoxy, acyloxy, halo, or benzyl, or R_1 and R_2 together with the nitrogen atom to which they are bonded form a heterocyclic group, and R_3 is a vinyl group.

5,814,657

1,3-BENZODIOXOLE AND 1,2-DIALKOXYBENZENE DERIVATIVES AS OCULAR HYPOTENSIVE AGENTS

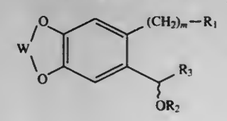
Robert M. Burk, Laguna Beach, and David F. Woodward, El Toro, both of Calif., assignors to Allergan, Irvine, Calif.

Division of Ser. No. 607,736, Feb. 27, 1996, Pat. No. 5,714,621, which is a continuation of Ser. No. 345,176, Nov. 28, 1994, Pat. No. 5,523,296, which is a continuation-in-part of Ser. No. 51,104, Apr. 21, 1993, Pat. No. 5,369,127. This application Nov. 21, 1997, Ser. No. 975,812

Int. Cl.[6] A61K *31/36;31/38;* **C07D** *409/06;317/54*

U.S. Cl. 514—444 **13 Claims**

1. A compound of the formula



where

W is $(CH_2)_n$ where n is 1 or 2;

m is an integer between 1 and 8;

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R_1 is COOH or a pharmaceutically acceptable salt thereof, $COOR_4$, $CONR_5R_6$, $CONR_5SO_2R_7$, CH_2OH, CH_2OR_7, CH_2—$OCOR_7$, CH_2O—$CONR_5R_7$, CH_2OCOOR_7, $CH_2NR_5R_6$, $CH_2NR_5COR_7$, CHO, $CH(OR_8)_2$, $CH(OR_9O)$, —COR_{10}, $CR_{10}(OR_8)_2$, or $CR_{10}(OR_9O)$, where R_4 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_4 is phenyl or lower alkylphenyl, R_5 and R_6 independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, R_7 is alkyl of 1 to 10 carbons, phenyl or lower alkylphenyl, R_8 is lower alkyl, and R_9 is divalent alkyl radical of 2–5 carbons, R_{10} is an alkyl or cycloalkyl containing 1 to 5 carbons;

R_2 is H, COR_7, R_7, CO—OR_7, CO—NR_5R_7, $PO(OH)OR_7$, $PO(OR_7)_2$, POR_7OH, or $POR_7(OR_7)$;

R_3 is heteroaryl substituted lower alkyl, with the proviso that when W is CH_2 then R_3 is not thienyl substituted lower alkyl nor furyl substituted lower alkyl.

5,814,658

TAXOIDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hervé Bouchard, Ivry Sur Seine; Jean-Dominique Bourzat, Vincennes, and Alain Commercon, Vitry-Sur-Seine, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

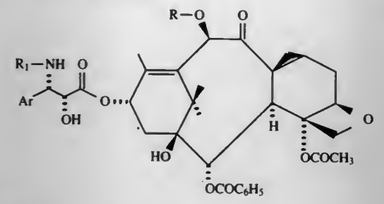
Continuation-in-part of Ser. No. 162,984, Dec. 8, 1993. This application Jun. 7, 1995, Ser. No. 477,518

Claims priority, application France, Dec. 9, 1992, 92 14813

Int. Cl.[6] A61K *31/335;* **C07D** *305/14*

U.S. Cl. 514—449 **29 Claims**

1. A taxoid of the formula:



in which

R represents an alkoxyacetyl radical,

R_1 represents a benzoyl radical or a radical R_2—O—CO in which R_2 represents an alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, bicycloalkyl, phenyl or heterocyclyl radical, and Ar represents an aryl radical.

5,814,659

TOPICAL ANALGESIC COMPOSITION

Harry Richardson Elden, Miami, Fla., assignor to DTR Dermal Therapy (Barbados) Inc., Bridgetown, Barbados

Filed Apr. 23, 1996, Ser. No. 636,440

Int. Cl.[6] A61K *31/27;31/335;31/22;31/225*

U.S. Cl. 514—452 **42 Claims**

1. A topical analgesic composition comprising:

a topical analgesic agent in an amount sufficient to induce analgesia; and

an alcohol, a chaotropic agent and an unsaturated fatty acid, in amounts sufficient to enhance penetration of the topical analgesic agent.

5,814,660

9-OXA PROSTAGLANDIN ANALOGS AS OCULAR HYPOTENSIVES

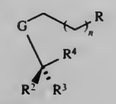
Robert D. Selliah, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Jun. 18, 1997, Ser. No. 878,030

Int. Cl.[6] A61K *31/34*

U.S. Cl. 514—461 **19 Claims**

1. A method of treating glaucoma or ocular hypertension in a patient, which comprises administering to the patient a pharmaceutically effective amount of a compound of the formula following III:



III

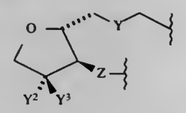
wherein:

R=ophthalmically acceptable ester moiety, CO_2R^1, $CONR^7R^8$, CH_2OR^9, or $CH_2NR^{10}R^{11}$, where R^1=H, a cationic salt moiety, or an ophthalmically acceptable ammonium moiety; R^7 and R^8 are the same or different=H or alkyl; R^9=H, acyl, or alkyl;

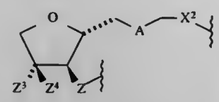
and R^{10} and R^{11} are the same or different=H, acyl, or alkyl; with the proviso that if one of R^{10} and R^{11}=acyl, then the other=H or alkyl;

n=0 or 2;

G is:

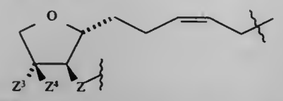


(i)



(ii)

or



(iii)

wherein:

Y=cis CH_2CH=CH, cis CH=$CHCH_2$, or $CH_2CH_2CH_2$;

Z=C≡C, trans CH=CH, or CH_2CH_2;

one of Y^2 and Y^3=H, and the other=halogen or OH, where the OH may be free or functionally modified;

X^2=O, S, or CH_2;

A=cis CH=CH, CH_2CH_2, or C≡C ; and

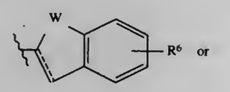
one of Z^3 and Z^4=H, and the other=OH, where the OH may be free or functionally modified; or Z^3 and Z^4 taken together=double bonded O;

one of R^2 and R^3=H, and the other=F or OH, where the OH may be free or functionally modified; or R^2 and R^3 taken together=OCH_2CH_2O or double bonded O; and

R^4=cyclohexyl, linear or branched C_5–C_7 alkyl, or R^5, wherein:

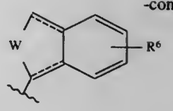
R^5=$(CH_2)_m$Xphenyl or $(CH_2)_p$ Z^2, where X=O or CH_2; m=1-6; the phenyl is either unsubstituted or substituted with R^6, where R^6=halogen, CH_3, CF_3, CN, OCH_3 or acetyl; p=0-6; and

Z^2=



or

-continued



wherein:

W=O,CH_2, CH_2CH_2, or CH=CH; and R^6 is as defined above; provided that when G is (i) then R^4=R^5 and when G is (ii) or (iii) then R^4=cyclohexyl, linear or branched C_5–C_7 alkyl, and R^2, R^3 are different=H, and OH.

5,814,661

USE OF PHTHALIDYLIDEN ESTERS OF CARNITINE AND ALKANOYL CARNITINES FOR THE TREATMENT OF ENDOTOXIC SHOCK

Vito Ulderico Ruggiero, and Piero Foresta, both of Rome, Italy, assignors to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

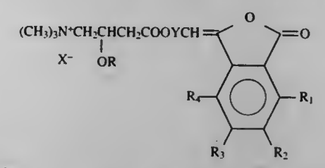
Filed Sep. 19, 1995, Ser. No. 530,581

Claims priority, application Italy, Sep. 29, 1994, RM94A0625

Int. Cl.[6] A61K *31/34*

U.S. Cl. 514—470 **12 Claims**

1. A therapeutical method for treating endotoxic shock which comprises administering to a patient in need thereof prior to the onset of endotoxic shock to reduce the amount of tumor necrosis factor (TNF) produced during a subsequent endotoxic shock episode a therapeutically effective amount of a (3-phthalidyliden) alkyl ester of camitine or alkanoyl carnitine of general formula (I)



(I)

wherein:

Y is a C_1–C_5 alkylene group, unsubstituted or substituted with one or more lower C_1–C_4 alkyl groups;

R is hydrogen of C_2–C_6 alkanoyl; R_1, R_2, R_3 and R_4, identical or different, are hydrogen, halogen, C_1–C_8 alkoxy, lower C_1–C_4 alkyl, halogen-substituted lower alkyl, amino, alkyl-substituted amino wherein the alkyl group has 1 to 4 carbon atoms, nitro, cyano, C_1–C_4 alkanoylamino, or R_1 and R_2 taken together, R_2 and R_3 taken together or R_3 and R_4 taken together form a C_1–C_4 alkylenedioxy group, and

X is the anion of a pharmacologically acceptable acid.

5,814,662

SKIN TREATMENT WITH ALPHA-HYDROXYCARBOXYLIC ACIDS OF MIXED CHAIN LENGTH

Alexander Paul Znaiden, Trumbull; Brian Andrew Crotty, Branford, and Anthony Johnson, Fairfield, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Nov. 1, 1996, Ser. No. 742,990

Int. Cl.[6] A01N *37/00;* **A61K** *31/19*

U.S. Cl. 514—557 **11 Claims**

1. A cosmetic composition comprising:

(i) from 0.01 to 15% by weight of a C_2–C_4 alpha-hydroxycarboxylic acid;

(ii) from 0.01 to 15% by weight of a mixture of C_{16} and C_{18} alpha-hydroxycarboxylic acids in a relative weight ratio from 5:1 to 2:1; and

(iii) from 1 to 99.9% of a pharmaceutically acceptable carrier.

5,814,663

METHOD FOR MAINTAINING AN EXISTING LEVEL OF BODY FAT

Mark E. Cook, and Michael W. Pariza, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 297,472, Aug. 29, 1994, Pat. No. 5,554,646, and Ser. No. 659,845, Jun. 7, 1996. This application Aug. 28, 1996, Ser. No. 736,562

Int. Cl.[6] A61K *31/20*

U.S. Cl. 514—560 **6 Claims**

1. A method of treating a human to maintain a level of body fat of the human at an existing level, said method comprising administering to said human about 100 milligrams to about 20,000 milligrams of conjugated linoleic acid per day.

5,814,664

3-ALKYLAMINO-2-HYDROXY-4-HYDROXYMETHYL-2-CYCLOPENTEN-1-ONE ADVANCED GLYCOSYLATION ENDPRODUCTS AND METHODS OF USE THEREOF

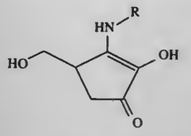
Peter C. Ulrich, Old Tappan, N.J., and Xini Zhang, Hoover, Ala., assignors to Picower Institute for Medical Research, Manhasset, N.Y.

Filed Jun. 23, 1997, Ser. No. 880,565

Int. Cl.[6] G01N *33/53*

U.S. Cl. 514—579 **12 Claims**

1. A pharmaceutical composition for increasing macrophage recognition and elimination of advanced glycosylation endproducts which comprises a therapeutic amount of a compound of the formula



wherein R is a lower alkyl group containing from 1 to 6 carbon atoms, together with a pharmaceutically acceptable carrier therefor.

5,814,665

Patent Not Issued For This Number

5,814,666

ENCAPSULATED AND NON-ENCAPSULATED NITRIC OXIDE GENERATORS USED AS ANTIMICROBIAL AGENTS

Shawn J. Green, Vienna, Va., and Larry K. Keefer, Bethesda, Md., assignors to The United States as represented by the Department of Health and Human Services, Washington, D.C., and Entremed, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 319,744, Oct. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 133,601, Oct. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 867,759, Apr. 13, 1992, abandoned. This application Apr. 24, 1995, Ser. No. 428,632

Int. Cl.[6] A61K *31/13;9/127*

U.S. Cl. 514—611 **26 Claims**

1. A method of killing or inhibiting the proliferation of infectious or pathogenic microorganisms in a human or an animal,

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which method comprises administering to said human or animal a compound capable of releasing nitric oxide in an aqueous solution such that said infectious or pathogenic microorganisms are exposed to nitric oxide and such that the proliferation of said infectious or pathogenic microorganism is inhibited or said infectious or pathogenic microorganism is killed.

5,814,667

USE OF NITRIC OXIDE-RELEASING COMPOUNDS AS HYPOXIC CELL RADIATION SENSITIZERS

James B. Mitchell, Damascus; Angelo Russo, Bethesda; Murali C. Krishna, Derwood; David A. Wink, Jr., Hagerstown, all of Md., and James E. Liebmann, Albuquerque, N. Mex., assignors to United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 319,888, Oct. 7, 1994, Pat. No. 5,650,442, which is a continuation-in-part of Ser. No. 133,574, Oct. 8, 1993, abandoned. This application Mar. 11, 1997, Ser. No. 814,419

Int. Cl.[6] A61K *31/13;31/44;31/495;31/445*

U.S. Cl. 514—611 **6 Claims**

1. A method of sensitizing hypoxic cells in a tumor in a mammal to ionizing radiation administered during radiotherapy, which method comprises administering to a mammal having a tumor containing hypoxic cells a radiation-sensitizing effective amount of a nitric oxide-containing compound that spontaneously releases nitric oxide under physiological conditions without requiring the presence of oxygen prior to radiotherapy, wherein said compound is a compound of formula O=N—S—R, wherein R is selected from the group consisting of a C_1–C_8 alkyl, a C_3–C_{10} aryl, a C_4–C_{10} heterocyclic nitrogen-containing radical, a C_3–C_{10} aryl substituted with a C_1–C_3 alkyl, and a C_3–C_{10} cycloalkyl, which R groups may be substituted by 1–3 substituents, which may be the same or different and are selected from the group consisting of halo, hydroxy, C_1–C_8 alkoxy, amino, amido, formyl, carboxy, and nitro.

5,814,668

METHODS AND COMPOSITIONS FOR CONTROLLING BIOFOULING USING AMIDES

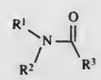
Marilyn S. Whittemore, Memphis; Daniel E. Glover, Brighton; Mark L. Zollinger, and Stephen D. Bryant, both of Memphis, all of Tenn., assignors to Buckman Laboratories International Inc., Memphis, Tenn.

Filed Sep. 29, 1995, Ser. No. 536,978

Int. Cl.[6] A01N *37/18*

U.S. Cl. 514—625 **24 Claims**

1. A method to inhibit bacteria from adhering to a submergible surface comprising the step of contacting the submergible surface with an amide in an amount effective to inhibit bacteria from adhering to the submergible surface, wherein the amide is a compound of the formula:



wherein

R^1 and R^2 may each independently be hydrogen, a C_1–C_4 alkyl group, or a C_1–C_4 hydroxyalkyl group, and

R^3 is a saturated C_5–C_{20} alkyl group.

5,814,669

AMINO ACID DERIVATIVES AND THEIR USE AS PESTICIDES

Uwe Stelzer, Burscheid; Carl Casser, Köln, and Thomas Seitz, Langenfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP95/02321, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO96/00718, PCT Pub. Date Jan. 1, 1996

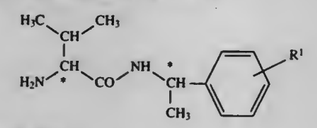
PCT Filed Jun. 16, 1995, Ser. No. 765,470

Claims priority, application Germany, Jun. 28, 1994, 44 22 567.9; Jan. 17, 1995, 195 01 175.9

Int. Cl.[6] A61K *31/165;* **C07C** *233/05;231/10*

U.S. Cl. 514—626 **5 Claims**

1. A compound of the formula (Ia):



(Ia)

in which

R^1 represents chlorine, methyl, ethyl or methoxy; or a salt thereof.

5,814,670

USE OF INSULIN SENSITIZING AGENTS TO TREAT HYPERTENSION

Jerry R. Colca, Kalamazoo, Mich., assignor to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 320,019, Oct. 7, 1994, Pat. No. 5,719,188, which is a division of Ser. No. 52,216, Apr. 22, 1993, Pat. No. 5,356,913, which is a continuation of Ser. No. 919,515, Jul. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 478,090, Feb. 9, 1990, abandoned. This application Nov. 4, 1997, Ser. No. 963,725

Int. Cl.[6] A61K *31/155*

U.S. Cl. 514—635 **1 Claim**

1. A method for treating patients who are not exhibiting diabetes but are exhibiting or are susceptible to insulin-resistant hypertension comprising administering to said patient an effective amount of metformin.

5,814,671

SITE SELECTIVE ION EXCHANGE RESINS TEMPLATED FOR LEAD (II) ION AND METHODS AND DEVICES FOR THEIR USE

George M. Murray, Baltimore, Md., assignor to University of Maryland, Baltimore County, Baltimore, Md.

Filed Apr. 16, 1996, Ser. No. 632,831

Int. Cl.[6] C08J *5/20;* **C02F** *1/42;* **B01J** *39/18;* **G01N** *27/26*

U.S. Cl. 521—31 **7 Claims**

1. An ion selective electrode which utilizes a Pb(II) ion templated ion exchange resin, wherein said Pb(II) ion templated ion exchange resin is synthesized by the steps of:

copolymerizing styrene monomers with lead vinylbenzoate complexes and simultaneously cross-linking said complexes with divinylbenzene; and

removing said Pb(II) ion by acid washing thereby creating cavities templated for Pb(II) ion.

5,814,672

STRONGLY BASIC ANION EXCHANGE RESIN AND PROCESS FOR ITS PRODUCTION

Atsuo Kiyokawa, and Ryuichi Sugimoto, both of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Nov. 28, 1995, Ser. No. 563,825

Claims priority, application Japan, Dec. 5, 1994, 6-301123

Int. Cl.[6] C08F *08/32;08/24*

U.S. Cl. 521—32 **20 Claims**

1. A strongly basic anion exchange resin having trimethylamine quaternary ammonium groups and a cross-linked three dimensional polymer structure formed by copolymerization of a monovinyl aromatic monomer with a cross-linkable aromatic monomer, wherein the water content X (wt %) of the resin with counter ions being a chloride ion and the salt-splitting capacity Y (meq/g-Resin) are in a relation represented by the following formula (1) or (2):

$$Y \geqq 0.0214X+3.26 \quad (1)$$

provided $50<X\leqq 75$

$$Y \geqq 0.0722X+0.711 \quad (2)$$

provided $40\leqq X\leqq 50$.

5,814,673

RECONSTITUTED POLYMERIC MATERIALS DERIVED FROM POST-CONSUMER WASTE, INDUSTRIAL SCRAP AND VIRGIN RESINS MADE BY SOLID STATE PULVERIZATION

Klementina Khait, Skokie, and Mark Anton Petrich, Evanston, both of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation of Ser. No. 163,915, Dec. 7, 1993, abandoned. This application Apr. 26, 1996, Ser. No. 639,344

Int. Cl.[6] B29B *17/00*

U.S. Cl. 521—40 **11 Claims**

2. A method for manufacture of a powder of polymeric material from a supply of polymeric material in the form of chips or particles, comprising, in combination, the following steps:

(a) compounding a polymer material of polymeric chips or particles;

(b) introducing the polymer material into a pulverization device of the type having an inlet for the polymer material, means for pulverizing the polymer material to effect chemical change to the polymer material by means of solid state shear pulverization in the presence of cooling sufficient to maintain the polymer material solely in the solid state during the pulverization, an outlet for the pulverized material, and means for cooling the temperature of the polymer material between the inlet and outlet;

(c) cooling the polymer material to maintain the polymer material in the solid state without melting within the pulverization device;

(d) pulverizing the solid state polymer material within the pulverization device to chemically alter the polymer material; and

(e) discharging the resulting pulverized powder from the outlet.

5,814,674

METHOD FOR PROCESSING RESIDUE-CONTAINING PACKAGES

Mathias Pauls, and Torsten Kellner, both of Appenzell, Switzerland, assignors to Rathor AG, Appenzell, Switzerland

Continuation of Ser. No. 325,271, Feb. 3, 1995, abandoned. This application Sep. 3, 1996, Ser. No. 697,879

Claims priority, application Germany, Feb. 4, 1993, 43 03 168.4

Int. Cl.[6] C08J *11/04;3/00;* **B01D** *1/00*

U.S. Cl. 521—49 **21 Claims**

1. Method for processing pressurized aerosol cans containing polyurethane prepolymer residues, while recovering aerosol can materials and said polyurethane prepolymer residues, said method comprising the steps of:

placing pressurized aerosol cans containing polyurethane prepolymer residues into a working container while, at the same time, opening the aerosol cans and extracting at least the prepolymer residues with a solvent, wherein a residue-containing solution and residue aerosol can materials are formed;

transferring the residue-containing solution from the working container to a distillation container;

concentrating the residue-containing solution in the distillation container by evaporating the solvent therefrom, thereby leaving at least the prepolymer residues;

condensing the evaporated solvent and returning the solvent to the working container;

removing the aerosol can materials from the working container to recover said aerosol can materials;

recovering at least the prepolymer residues in concentrated form from the distillation container; and

providing a protective atmosphere in at least said working and distillation containers, wherein at least said steps of placing the pressurized aerosol cans into a working container, opening the aerosol cans, extracting at least the prepolymer residues with a solvent, transferring the residue-containing solution to a distillation container, concentrating the residue-containing solution in the distillation container, condensing the evaporated solvent and removing the aerosol can materials from the working container are conducted in a protective atmosphere consisting of solvent vapors and propellant gas.

5,814,675

PROCESS FOR THE PREPARATION OF POLYURETHANE MICROSPHERES

Parshuram Gajanan Shukla, and Swaminathan Sivaram, both of Maharashtra, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Mar. 30, 1998, Ser. No. 50,798

Int. Cl.[6] C08J *9/16;9/20*

U.S. Cl. 521—56 **18 Claims**

1. A process for the preparation of polyurethane microspheres, which comprises of preparing a solution of diol or polyol having a molecular weight in the range of 200–2000, crosslinker and a catalyst selected from amino or organometallic compounds, dispersing this solution in dilute solution of stabilizer which consists of a block copolymer having the general formula $[A]_n$—$[B]_m$ where A and B are chemically and compositionally dissimilar segments and n and m segments are in between 30–115 and 10–60 units respectively, such that the sum of n and m does not exceed 175 units, in an aliphatic hydrocarbon, adding an isocyanate dropwise to this dispersion, agitating the mixture at high speed of 100–1200 revolutions per minute, a temperature between 30° to 55° C. to permit the formation of polyurethane microspheres, separating these microspheres by filtration, washing with lower aliphatic hydrocarbon and drying the microspheres under vacuum.

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5,814,676

FLEXIBLE POLYURETHANE FOAMS AND A PROCESS FOR THE PRODUCTION THEREOF

Gundolf Jäcobs, Rösrath, and Peter Haas, Haan, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 24, 1997, Ser. No. 976,929

Claims priority, application Germany, Dec. 2, 1996, 196 49 829.5

Int. Cl.[6] C08G *18/32*

U.S. Cl. 521—174 **10 Claims**

1. A process for the production of flexible polyurethane foams comprising reacting:

A) at least one polyisocyanate or a prepolymer thereof;

B) an isocyanate-reactive component comprising:

i) at least one polyether polyol having a functionality of more than 2.5 to 6, and containing at least 75% by weight of propylene oxide in the EO/PO chain,

ii) at least one polyether polyol having a functionality of 1.8 to less than 2.5, and containing at least 75% by weight of propylene oxide in the EO/PO chain, and

iii) at least one polyether polyol having a functionality of 1.8 to 6.0 and containing at least 50% by weight of ethylene oxide in the EO/PO chain; and

C) water.

5,814,677

Patent Not Issued For This Number

5,814,678

CHEMICAL REACTIONS IN WATER-IN-CARBON DIOXIDE MICROEMULSIONS AND CONTROL THEREOF

Theodore W. Randolph, Niwot, Colo., assignor to University Technology Corp., Boulder, Colo.

Filed Jan. 31, 1997, Ser. No. 792,517

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—18 **14 Claims**

1. A method of regulating the initiation or rate of a chemical reaction for which reaction components are present in reverse micelles of water-in-carbon dioxide emulsion in a closed system, wherein said carbon dioxide is in a supercritical fluid state in said closed system, said method comprising the step of: adjusting pressure within the closed system to a level at which sufficient water exists within reverse micelles such that a sufficient quantity of at least one ionizable reaction component is dissolved within the micelles and such that ionization of at least one component within the micelles either takes place or decreasing the pressure such that a concentration of an ionized reaction component decreases.

5,814,679

PREMIUM RELEASE PHOTO-CURABLE SILICONE COMPOSITIONS

Richard P. Eckberg, Saratoga Springs, and Robert F. Agars, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Oct. 18, 1996, Ser. No. 733,435

Int. Cl.[6] C08G *77/14;59/62;59/30*

U.S. Cl. 522—31 **20 Claims**

1. A photo-curable epoxy silicone composition comprising:

(a) an epoxy functional silicone;

(b) a carbinol containing siloxane of the general formula:

$$M_{e+M}{}^{C}{}_{f}D_{o}D^{C}{}_{q}T_{r}T^{C}{}_{s}Q_{t}$$

with the subscripts e, f, o, q, r, s and t being zero or positive subject to the limitation that at least one of the subscripts f, q, and s are non-zero and positive, where

$Q=SiO^{4/2}$;

$M=R^1R^2R^3SiO_{1/2}$,

with R^1, R^2 and R^3 each monovalent radicals and each independently selected, independent of the choice of R^1 and R^2 for M^C, D, D^C, and T from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl;

$M^C=R^1R^2R^5SiO_{1/2}$, with R^1 and R^2 each monovalent radicals and each independently selected, independent of the choice of R^1 and R^2 for M, D, D^C, and T, from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl;

$D=R^1R^2SiO_{2/2}$, with R^1 and R^2 each monovalent radicals and each independently selected, independent of the choice of R^1 and R^2 for M, M^C, D^C, and T, from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl;

$D^C=R^1R^5SiO^{2/2}$, with R^1 a monovalent radical independently selected, independent of the choice of R^1 for M, M^C, D, and T, from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl;

$T=R^1SiO_{3/2}$, with R^1 a monovalent radicals independently selected, independent of the choice of R^1 for M, M^C, D, and D^C, from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl;

$T^C=R^5SiO^{3/2}$, with

R^5 a monovalent radical, independently selected for each M^C, D^C, and T^C, having the formula:

$$-R^1R^2C-CHR^3R^4$$

where each R^1, R^2, and R^3 are independently selected, independent of the choice of R^1, R^2 and R^3 for M, M^C, D, D^C, and T, from the group consisting of hydrogen, one to forty carbon monovalent hydrocarbon radicals, and trifluoropropyl; and R^4 a monovalent hydrocarbon radical selected from the group of monovalent radicals having the formula:

$$C_aH_{2a+1-b}G_\theta A(OH)_b,$$

with the subscript a an integer of one or greater and the subscript b a positive integer subject to the limitation that b is less than or equal to 2a+1 and where G_θ is divalent O or divalent S and the subscript θ is zero or one; and

$$C_cH_{2c-7-d}G_\theta A(OH)_d,$$

with the subscript c being an integer 6 or greater and the subscript d a positive integer subject to the limitation that d is less than or equal to 2c−7, where

$$A=(((CH2)_\alpha O)_\beta((CH2)_\gamma O)_\pi)$$

where the subscripts α, β, γ, and π are zero or positive subject to the limitation that if α is zero, β is zero and subject to the limitation that if γ is zero, π is zero; and

(c) a photo-catalyst.

5,814,680

SOFT INTRAOCULAR LENS

Suguru Imafuku; Migio Hamano, and Hidetoshi Iwamoto, all of Tokyo, Japan, assignors to Hoya Corporation, Japan

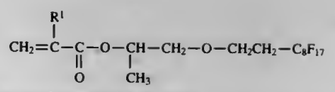
Filed Feb. 21, 1996, Ser. No. 606,046

Claims priority, application Japan, Feb. 23, 1995, 7-35228

Int. Cl.[6] C08F *220/30*

U.S. Cl. 523—106 **7 Claims**

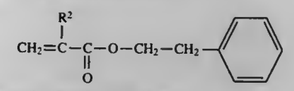
1. A soft intraocular lens consisting of a copolymer formed from 5 to 20% by weight of a perfluorooctylethyloxypropylene (meth) acrylate monomer of the general formula (I),



(I)

wherein R^1 is hydrogen or methyl,

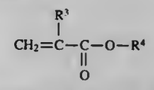
40 to 60% by weight of a 2-phenylethyl (meth)acrylate monomer of the general formula II,



(II)

wherein R^2 is hydrogen or methyl,

30 to 50% by weight of an alkyl (meth)acrylate monomer of the general formula (III),



(III)

wherein R^3 is hydrogen or methyl and R^4 is a linear or branched C_4–C_{12} alkyl group, and

0.5 to 4% by weight, based upon the total of monomers (I), (II) and (III), of a crosslinking monomer as essential monomer components.

5,814,681

RESTORATIVE COMPOSITION FOR HARD TISSUE AND DISPENSING APPARATUS THEREFOR

Kenichi Hino, and Toshihide Nakashima, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

PCT No. PCT/JP95/02110, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO96/11715, PCT Pub. Date Apr. 25, 1996

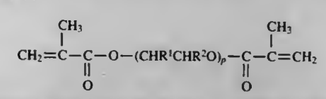
PCT Filed Oct. 13, 1995, Ser. No. 652,599

Claims priority, application Japan, Oct. 13, 1994, 6-247942

Int. Cl.[6] A61L *25/00;* **A61K** *6/08;* **C08K** *3/32*

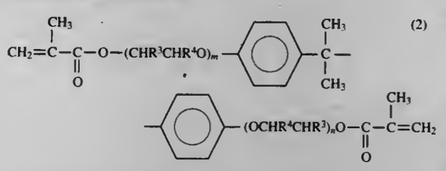
U.S. Cl. 523—113 **3 Claims**

1. A restorative composition for hard tissue, comprising a paste (A) comprising an inorganic calcium phosphate powder, a polymerizable monomer mixture and a polymerization initiator, and a paste (B) comprising an inorganic calcium phosphate powder, a polymerizable monomer mixture and a polymerization accelerator, wherein the content of the inorganic calcium phosphate powder in each paste is 75–85% by weight, and the above-mentioned polymerizable monomer mixtures each contain a monomer of the formula (1):



(1)

wherein R^1 and R^2 may be the same or different and each is a hydrogen atom or a methyl, and p is an integer of 1–4, and a monomer of the formula (2):



(2)

wherein R^3 and R^4 may be the same or different and each is a hydrogen atom or a methyl, m and n are each an integer of 1–5, and m+n is 2–6, the monomer of formula (1) being contained in a proportion of 40–65% by weight based on the total weight of the monomer mixtures wherein said paste (A) and said paste (B) each have a consistency in the range 20–27 mm and wherein the inorganic calcium phosphate powder has been subjected to primary treatment with an organic silane coupling agent, heat-treated at a temperature of 300°–800° C. and subjected to secondary treatment with an organic silane coupling agent.

5,814,682

METHOD OF LUTING A PROVISIONAL PROSTHETIC DEVICE USING A GLASS IONOMER CEMENT SYSTEM AND KIT THEREFOR

Richard P. Rusin; Paula D. Ario; Dwight W. Jacobs; Joel D. Oxman; Sumita B. Mitra, and Ronald M. Randklev, all of P.O. Box 33427, St. Paul, Minn. 55133-3427

Filed Jun. 14, 1996, Ser. No. 663,727

Int. Cl.[6] C08K *3/34*

U.S. Cl. 523—116 **12 Claims**

1. A method for luting a prosthetic device to tooth structure comprising the steps of

(i) providing a kit containing components (A), (B), and (C), wherein said components comprise:

(A) a composition comprising a water miscible, acidic polymer

(B) a composition comprising a finely divided, acid-reactive filler and an adhesion reducing component such that when mixed with component (A), the Bulk Shear Adhesion of the resulting cement is less then 2.0 MPa

(C) a composition comprising a finely divided, acid-reactive filler such that when mixed with component (A), the Bulk Shear Adhesion of the resulting cement is greater than 2.0 MPa

(ii) determining whether a provisional luting cement is required or a permanent luting cement,

(iii) if a provisional luting cement is required, mixing (A) with (B), and omitting step (iv),

(iv) if a permanent luting cement is required, mixing (A) with (C),

(v) applying the cement created by step (iii) or (iv) on the prosthetic device and/or the tooth structure, and

(vi) bonding the device to tooth structure.

5,814,683

POLYMERIC ADDITIVES FOR THE ELIMINATION OF INK JET AEROSOL GENERATION

Bradley B. Branham, Portland, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 6, 1995, Ser. No. 567,973

Int. Cl.[6] C09D *11/10*

U.S. Cl. 523—161 **14 Claims**

1. An ink-jet ink composition comprising at least one dye and a vehicle including water, said ink-jet ink composition exhibiting a reduction in aerosol formation during printing by further comprising at least one polymer selected from the group consisting of polyacrylamides, polyvinylpyrrolidones, and mixtures thereof and present in said ink-jet ink composition within the range of about 5 to 10 ppm.

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5,814,684

ANTI-FOGGING AGENT FOR THERMOPLASTIC RESIN SURFACE AND ANTI-FOGGING THERMOPLASTIC RESIN SHEET

Shuji Yoshioka, Hyogo, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 5, 1995, Ser. No. 539,785

Claims priority, application Japan, Oct. 5, 1994, 6-241215

Int. Cl.[6] C09K *3/16;3/18*

U.S. Cl. 523—169 **10 Claims**

1. An anti-fogging agent for the surface of a thermoplastic resin sheet, comprising a polyvalent alcohol incorporated therein in an amount of from 1 to 15 parts by weight based on 100 parts by weight of a mixture of a sucrose aliphatic ester mixture-and a coat-forming hydrophilic polymeric compound.

5,814,685

INK JET RECORDING LIQUID

Sunao Satake; Seiji Sawada; Yasuharu Iida, and Tsutomu Fujigamori, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1997, Ser. No. 819,447

Claims priority, application Japan, Mar. 18, 1996, 8-060492

Int. Cl.[6] C09D *11/10;* **C08L** *33/06;25/04*

U.S. Cl. 523—201 **10 Claims**

1. An ink jet recording liquid obtained by dispersing a pigment and a resin in an aqueous medium, said resin comprising a shell composed of a polymer having a glass transition point in the range of 50° C. to 150° C. and a core composed of a polymer having a glass transition point in the range of −100° C. to 40° C., wherein said resin is contained in an amount in the range of 0.1 to 10 wt. % of the recording liquid.

5,814,686

COLORED METALLIC PIGMENTS

Fortunato J. Micale, Bethlehem, and William G. Jenkins, Plymouth, both of Pa., assignors to Silberline Manufacturing Co., Inc., Tamaqua, Pa.

Continuation of Ser. No. 322,522, Oct. 14, 1994, abandoned, which is a continuation of Ser. No. 104,613, Aug. 11, 1993, abandoned, which is a continuation of Ser. No. 860,607, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 409,828, Sep. 20, 1989, abandoned. This application May 1, 1995, Ser. No. 431,622

Int. Cl.[6] C08K *3/08;* **B32B** *5/16*

U.S. Cl. 523—205 **9 Claims**

1. A colored pigment for imparting color and metallic luster to a surface coating, comprising:

a plurality of metallic flakes or mica flakes wherein the metallic flakes are selected from the group consisting of aluminum, brass, bronze, gold and zinc, of a size sufficient to adhere 4–25% by weight polymer encapsulated pigments through coulombic interaction; and

submicron-sized pigment particles encapsulated in a polymer matrix, the polymer being selected from the group consisting of vinyl acetal polymers, butyrals, bisphenol glycidyl ether type epoxy resin, rosin maleic copolymer resin, carboxyl functional acrylics, styrene/maleic anhydride copolymers and alkylated vinylpyrrolidone copolymers, the encapsulated pigment particles being adhered to and coloring the flakes, a plurality of encapsulated pigment particles being adhered to individual flakes, with the flakes not being continuously encapsulated by the polymer matrix.

5,814,687

MAGNETIC POLYMER PARTICLE AND PROCESS FOR MANUFACTURING THE SAME

Kiyoshi Kasai, Kameyama; Masayuki Hattori, Aichi, and Kakun Han, Tsukuba, all of Japan, assignors to JSR Corporation, Tokyo, Japan

Filed Jan. 30, 1997, Ser. No. 791,745

Claims priority, application Japan, Jan. 31, 1996, 8-015376

Int. Cl.[6] C08K *7/16*

U.S. Cl. 523—223 **10 Claims**

1. Magnetic polymer particles with a particle diameter of 0.5–30 μm, which comprises:

100 parts by weight of a copolymer which is composed of (A) 30–99% by weight of alkyl (meth)acrylate monomer unit having an alkyl group containing 4–20 carbon atoms, (B) 1–20% by weight of a monomer unit containing unsaturated carboxylic acid, and (C) 0–69% by weight of vinyl monomer unit which is copolymerizable with the monomers (A) and (B), and

3–100 parts by weight of a superparamagnetic substance.

5,814,688

ANTISTATICALLY TREATED POLYMERS

Bruno Hilti, Basel; Markus Bürkle, Birsfelden; Jürgen Pfeiffer, Reinach; Ernst Minder, Sissach, and Markus Grob, Allschwil, all of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Feb. 4, 1997, Ser. No. 795,719

Int. Cl.[6] C08L *1/02;89/00;89/04;97/02*

U.S. Cl. 524—9 **20 Claims**

1. A composition which comprises

(A) a thermoplastic, structurally crosslinked elastomeric or thermosetting polymer,

(a) a polar, adsorptive organic material in the form of fibers or particles which are in mutual contact, onto which is adsorptively bound

(b) a polar antistatic agent comprising a mixture of

b1) at least one polar organic compound having at least 5 carbon atoms and at least 3 heteroatoms selected from the group consisting of polyethers, crown ethers, polyols, polyimines, polyamines, polymers derived from pyridine, macrocyclic aza compounds, polysulfides and polyphosphines, and

b2) the salt of a protic acid which is solvated or complexed in the polar organic compound b1) and which is selected from the group consisting of $LiClO_4$, $LiCF_3SO_3$, $NaClO_4$, $LiBF_6$, $NaBF_6$, KBF_6, $NaCF_3SO_3$, $KClO_4$, KPF_6, KCF_3SO_3, $Ca(ClO_4)_2$, $Ca(PF_6)_2$, $Ca(CF_3SO_3)_2$, $Mg(ClO_4)_2$, $Mg(CF_3SO_3)_2$, $Zn(ClO_4)_2$, $Zn(PF_6)_2$ and $Ca(CF3SO_3)_2$.

5,814,689

LOW VISCOSITY POLYURETIDIONE POLYURETHANES AND THEIR USE AS CURATIVES FOR SOLVENT AND WATER BORNE COATINGS

Stephen L. Goldstein, Glen Mills, Pa.; James M. O'Connor, Branford, Conn.; Donald L. Lickei, Wayne, Pa.; Henry G. Barnowski, Jr., Durham, Conn.; Willard F. Burt, Bristol, Conn., and Ronald S. Blackwell, Waterbury, Conn., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed Aug. 29, 1997, Ser. No. 920,494

Int. Cl.[6] C08G *18/06;18/10;18/80*

U.S. Cl. 524—86 **7 Claims**

1. A polyuretidione polyurethane composition that is free of carbonate groups and carboxylic acid ester groups, said composition comprising, based on the weight of the polyuretidione polyurethane:

(a) from 5% to 20%, by weight, of uretidione groups, calculated as $(NCO)_2$ having a molecular weight of 84,

(b) from 10 to 30%, by weight, of urethane groups, calculated as $NHCO_2$ having a molecular weight of 59,

(c) less than 2%, by weight, of free isocyanate groups, calculated as NCO having a molecular weight of 42, and

(d) less than 7%, by weight, of isocyanurate groups, calculated as $(NCO)_3$ having a molecular weight of 126.

5,814,690

FLAME RETARDED POLY(BUTYLENE TEREPHTHALATE) COMPOSITION

Robert Earl Penn, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1997, Ser. No. 935,334

Int. Cl.[6] C08K *5/34*

U.S. Cl. 524—100 **7 Claims**

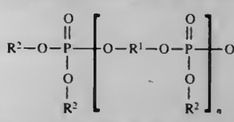
1. A flame retarded polyester composition which comprises:

(a) from about 5% by weight to about 45% by weight based on [(a)+(b)] of a reinforcing component; and

(b) from about 95% by weight to about 55% by weight based on [(a)+(b)] of a polymeric component which comprises:

(i) from about 65% by weight to about 45% by weight of poly(butylene terephthalate); and

(ii) from about 35% to about 55% by weight based on said polymeric componenf of a mixed flame retardant consisting essentially of from about 5% to about 25% by weight of an aromatic phosphate oligomer of the formula (I)



(I)

wherein R^1 is an arylene moiety and each R^2 is independently aryl or substituted aryl, n is an integer of from 1 to 5; and from about 95% to about 75% by weight of melamine pyrophosphate.

5,814,691

STABILIZED POLYVINYL CHLORIDE

Karl Josef Kuhn, Lautertal, and Wolfgang Wehner, Ober-Ramstadt, both of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Dec. 4, 1995, Ser. No. 566,772

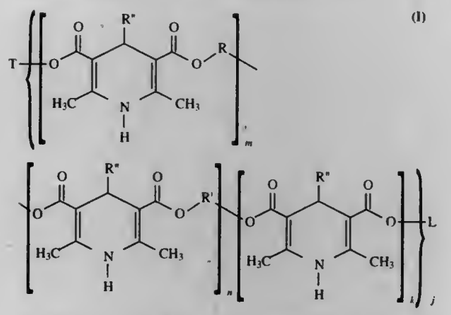
Int. Cl.[6] C08K *5/34;5/04*

U.S. Cl. 524—102 **11 Claims**

1. A composition comprising

(a) PVC,

(b) at least one polyDHP compound of formula I



(I)

in which T is C_1–C_{22}alkyl which is unsubstituted or substituted by C_1–C_{18}alkoxy, C_1–C_{18}alkylthio, hydroxy, acryloyloxy, methacryloyloxy, halogen, phenyl or naphthyl; or T is C_5–C_{10}aryl which is unsubstituted or substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen; or T is pyrryl, pyridyl, morpholinyl, furyl, thiazolyl or indolyl; or T is C_3–C_{10}alkenyl, CH_3—CO—CH_2—CO—OR—, CH_3—CO—CH_2—COOR'—, CH_3—C(NR'"$_2$)=CH—COOR— or CH_3—C(NR'"$_2$)=CH—COOR'—,

L is as defined for T or is a trivalent or polyvalent radical formed from a straight-chain or branched alkyl group which is unsubstituted or substituted by C_1–C_{12}alkoxy, C_1–C_{12}thioalkoxy, C_6–C_{10}aryl, C_1–C_{12}carboxyl or hydroxyl,

m and n are numbers from 0 to 20,

k is 0 or 1,

j is a number from 1 to 6 and the conditions j(k+m+n) and m+n>0 are fulfilled,

R and R', independently of one another, are methylene or phenylene or an alkylene group of the —(—C_pH_{2p}—X—)$_t$$C_pH_{2p}$-type which is unsubstituted or carries substituents from the series consisting of C_1–C_{12}alkoxy, C_1–C_{12}thioalkoxy, C_6–C_1aryl, C_1–C_{12}carboxyl and hydroxyl,

p is from 2 to 18,

t is from 0 to 10,

X is oxygen or sulfur,

or if k is 0 and j>1, R and R', together with L, are a direct bond,

R" is hydrogen or C_6–C_{10}aryl, C_2–C_{18}alkoxycarbonyl or C_1–C_{18}alkyl which is unsubstituted or substituted by one or more C_1–C_{12}alkyl, C_1–C_8alkoxy, halogen or NO_2 substituents, and

the two R'" are identical or different and are hydrogen, C_1–C_{18}alkyl, C_1–C_{18}hydroxyalkyl or C_1–C_{18}alkoxyalkyl or together are C_3–C_5alkylene which is uninterrupted or interrupted by —O—, or are straight-chain or branched C_2–C_{22}alkenyl,

(c) at least one substance from the group consisting of the crystalline hydrotalcites, and

(d) at least one zinc compound.

5,814,692

3 ARYLBENZOFURANONES AS STABILISERS

Peter Nesvadba, Marly, Switzerland, assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of Ser. No. 606,896, Feb. 26, 1996, which is a division of Ser. No. 304,468, Sep. 12, 1994, Pat. No. 5,516,920. This application Jun. 2, 1997, Ser. No. 867,111

Claims priority, application Switzerland, Sep. 17, 1993, 2810937

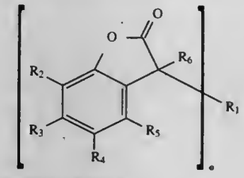
Int. Cl.[6] C08L *23/26*

U.S. Cl. 524—107 **28 Claims**

1. A composition comprising

(a) an organic material which is susceptible to oxidative, thermal or light-induced degradation, and

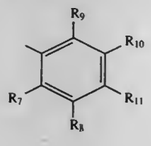
(b) at least one compound of formula I



(I)

wherein, when n is 1,

R_1 is a radical of formula II



(II)

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R_2, R_3, R_4 and R_5 are each independently of one another hydrogen or C_1–C_6alkyl, with the proviso that at least two of R_2, R_3, R_4 and R_5 are C_1–C_6alkyl;

R_6 is hydrogen; and

R_7, R_8, R_9, R_{10} and R_{11} are each independently of one another hydrogen or C_1–C_6alkyl, with the proviso that at least two of R_7, R_8, R_9, R_{10} and R_{11} are C_1–C_6alkyl.

5,814,693

COATINGS FOR CONCRETE CONTAINMENT STRUCTURES

Thomas G. Priest; Richard P. Chmiel; Richard L. Iazzetti, all of Houston, Tex., and Edward G. Brugel, Wilmington, Del., assignors to Forty Ten, L.L.C., Houston, Tex.

Filed Feb. 1, 1996, Ser. No. 595,131

Int. Cl.[6] C08K *5/54;3/34*

U.S. Cl. 524—188 **29 Claims**

1. A material for producing a monolithic, chemically resistant, flexible and resilient containment coating upon a concrete substrate, said material comprising:

between 30–40 percent-by-weight chlorosulfonated polyethylene;

at least 4 percent-by-weight 3-aminopropyl-triethoxy silane;

dibutyltin dilaurate as an accelerator;

0.1 to 3.0 percent-by-weight epoxy resin as a scavenger to neutralize hydrochloric acid appearing as an adduct in the cross-linking of said chlorosulfonated polyethylene and said silane; and

a carrier comprising at least two solvents including a first solvent and a tail solvent wherein said first solvent will evaporate from said material before at least a portion of said tail solvent will evaporate and wherein said tail solvent is present in a greater concentration than said first solvent, said carrier comprising 20–70 percent-by-weight of said material.

5,814,694

ANTI-REFLECTIVE COATING COMPOSITION

Satoshi Watanabe; Shigehiro Nagura, and Toshinobu Ishihara, all of Kubiki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1997, Ser. No. 833,052

Claims priority, application Japan, Apr. 15, 1996, 8-117087

Int. Cl.[6] C08K *5/09*

U.S. Cl. 524—238 **5 Claims**

1. A water-soluble coating composition for forming a layer to be placed on the upper surface of a resist, comprising an aqueous solution containing:

a) at least one water-soluble polymer selected from the group consisting of poly(N-vinylpyrrolidone) homopolymers and water-soluble copolymers of N-vinylpyrrolidone and other vinyl monomers,

b) at least one fluorine-containing organic acid selected from the group consisting of the compounds of formulae (1) through (6):

$$F(CF_2)_2COOH \quad (1)$$

$$H(CF_2)_2COOH \quad (2)$$

$$F(CF_2CF_2O)_mCF_2COOH \quad (3)$$

$$\begin{array}{ccc} F(CFCF_2O)_m & & CFCOOH \\ | & & | \\ CF_2 & & CF_2 \end{array} \quad (4)$$

$$F(CF_2)_2SO_2H \quad (5)$$

$$H(CF_2)_2SO_2H \quad (6)$$

wherein n is an integer from 4 to 15 inclusive and m is an integer from 1 to 10 inclusive, and

c) at least one amino acid derivative decreasing the acidity of the layer and preventing deactivation of acids on the surface of the resist.

5,814,695

SILICONE MOLDING COMPOSITIONS HAVING EXTENDED USEFUL LIFE

John J. Fitzgerald, Clifton Park; Bruce C. Kuhl, Troy; Philip J. McDermott, Albany, and Robert A. Smith, Clifton Park, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 525,253, Sep. 8, 1995. This application Jan. 21, 1997, Ser. No. 784,610

Int. Cl.[6] C08K *5/24*

U.S. Cl. 524—731 **20 Claims**

1. A silicone composition for making molds comprising an olefin or acetylene polymerization inhibitor selected from the group consisting of esters of thiodipropionic acid having the formula:

$$R'O_2CCH_2CH_2SCH_2CH_2CO_2R''$$

where R' and R" are each independently selected from the group of monovalent hydrocarbon radicals having from one to forty carbon atoms and

silicon polysulfides having the formula:

$$S_q\text{-}(R'\text{—}Si(OR'')_3)_2$$

where R' and R" is each independently selected from the group of monovalent hydrocarbon radicals having from one to forty carbon atoms and q is an integer ranging from 2 to 7.

5,814,696

POLYESTER RESIN COMPOSITION AND A RELAY COMPONENT FORMED THEREOF

Noritsugu Saiki; Katsuhiko Hironaka, and Hodaka Yokomizo, all of Chiba, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 385,596, Feb. 8, 1995, abandoned. This application Aug. 22, 1996, Ser. No. 701,550

Claims priority, application Japan, Feb. 10, 1994, 6-016185; Feb. 22, 1994, 6-024222; Jun. 16, 1994, 6-134102

Int. Cl.[6] C08L *67/02*

U.S. Cl. 524—412 **19 Claims**

1. A polyester resin composition having excellent vibration-damping and noise suppression properties and rigidity consisting essentially of

(A) an aromatic polyester resin wherein the aromatic polyester resin (A) consists essentially of a diol component which is an aliphatic glycol having 4 carbon atoms or cyclohexanedimethanol and a dicarboxylic acid component which is selected from the group consisting of benzenedicarboxylic acid and naphthalenedicarboxylic acid, and said aromatic polyester resin (A) having a flexural modulus of at least 1000 Mpa and an intrinsic viscosity of at least 0.50; and

(B) a polyester block copolymer resin which consists essentially of

(a) a polyester soft block consisting essentially of an aromatic dicarboxylic acid component and a diol component as main constituents wherein the polyester soft block (a) of the polyester block copolymer resin (B) contains aromatic dicarboxylic acid and aliphatic dicarboxylic acid and the proportion of the aromatic dicarboxylic acid of the polyester soft block (a) is at least 60 mol % of all the dicarboxylic acids and the aliphatic dicarboxylic acid is 40 mol % or less of all the dicarboxylic acids, and wherein the aromatic dicarboxylic acid soft block (a) of the polyester block copolymer resin (B) is selected from the group consisting of benzenedicarboxylic acid and naphthalenedicarboxylic acid, and having a melting point of about 100° C. or less or being amorphous and the diol component is an aliphatic glycol having 5 to 12 carbon atoms, and

(b) a polyester hard block consisting essentially of a diol component which is an aliphatic glycol having 2 to 4 carbon atoms or cyclohexanedimethanol and a dicarboxylic acid component selected from the group consisting of benzenedicarboxylic acid and naphthalenedicarboxylic acid and having a melting point of about 150° C. or more,

the proportion of the aromatic polyester resin (A) being 20 to 90% by weight based on the total weight of the aromatic polyester resin (A) and the polyester block copolymer resin (B).

5,814,697

COLOR MASTERBATCH RESIN COMPOSITION FOR PACKAGING MATERIAL FOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL AND PACKAGING MATERIAL

Mutsuo Akao, and Koji Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 502,137, Jul. 13, 1995, abandoned. This application Mar. 6, 1997, Ser. No. 812,806

Claims priority, application Japan, Jul. 13, 1994, 6-161453

Int. Cl.[6] C08L *51/04;53/00*

U.S. Cl. 524—495 **6 Claims**

1. A packaging material for a photographic photosensitive material, comprising a color masterbatch resin composition for a packaging material, which comprises a thermoplastic resin and a light-shielding material having a surface which has been coated with a surface-coating material dispersed into the thermoplastic resin, a resin composition for dilution, and a lubricant,

wherein the thermoplastic resin is a rubber-containing aromatic monovinyl resin which has a melt flow rate of 3 to 40 g/10 minutes, a Rockwell hardness of M 40 or more, a Vicat softening point of 78° C. or more, a bending elastic modulus of 20,000 kg/cm^2 or more and which contains 1 to 12 wt. % of a rubber material having a mean particle size of 0.1 to 10 μm;

wherein the surface-coating material is present in a coating amount of 0.001 to 2 wt. % of the weight of the packaging material for a photographic photosensitive material and is an ester of (i) an aliphatic monocarboxylic acid having 20 to 40 carbon atoms and (ii) a monovalent aliphatic alcohol having 20 to 40 carbon atoms;

wherein the light-shielding material is carbon black which has a DBP oil absorption value of not less than 50 ml/100 g and a total sulfur components content of 0.9% or less; and

wherein the lubricant is present in an amount of 0.01 to 10 wt. % of the weight of the packaging material for a photographic photosensitive material and is a fatty acid metal salt having 10 to 35 carbon atoms and a melting point of 70° to 180° C.

5,814,698

POLYTETRAFLUOROETHYLENE DISPERSIONS IN AN ORGANIC SOLVENT AND DISPERSING AGENTS EMPLOYED THEREIN

Laura Montagna, Arese, and Ezio Strepparola, Treviglio, both of Italy, assignors to Ausimont S.p.A., Milano, Italy

Filed Mar. 22, 1996, Ser. No. 620,572

Claims priority, application Italy, Mar. 24, 1995, MI95A0593

Int. Cl.[6] C08J *51/00;* **C08K** *51/00;* **C08L** *27/12*

U.S. Cl. 524—544 **11 Claims**

1. A dispersion of polytetrafluoroethylene (PTFE) in an organic solvent, comprising:

(A) from 2 to 40% by weight of PTFE in powder form;

(B) from 50 to 95% by weight of an organic solvent;

(C) from 0.5 to 10% by weight of a dispersing agent of formula:

$$(R_H\text{—}L)_y\text{—}(R_F\text{—}L)_xR_H \quad (I)$$

wherein:

x=1 and y=1;

R_H is a x-functional radical having an alkyl or cycloalkyl C_5–C_{70} or alkylaryl or arylalkyl C_{10}–C_{50}, linear or branched structure, optionally containing hydroxyl or C_1–C_4 alkoxy groups, or having a polyoxyalkylenic structure, wherein alkylene has from 2 to 4 carbon atoms and the number of oxyalkylenic units is comprised between 5 and 70;

R_F is (per)fluoropolyoxyalkylene radical having a number average molecular weight M_n comprised between 350 and 2,000;

L is a divalent organic group, bridging between R_F and R_H, selected from:

—CONR^1—; —CH$_2$(OCH$_2$CHR^2)$_a$—O—; —CH$_2$(OCH$_2$CHR^2)$_b$—O—CO—; —CH$_2$O(CH$_2$)$_c$—CO—O—;

wherein R^1 is —H or an C_1–C_4 alkyl; R^2 is —H or a C_1–C_2 alkyl; a, b, are integers from 0 to 6, c is a number from 1 to 3.

5,814,699

CONTINUOUS PROCESS FOR THE PREPARATION OF HIGHLY STABLE, FINELY DIVIDED, LOW VISCOSITY POLYMER POLYOLS OF SMALL AVERAGE PARTICLE SIZE

Mark R. Kratz, Krefeld; Manfred Dietrich, Leverkusen; Torsten Heinemann, Köln; Gundolf Jacobs, Rösrath; Josef Sanders, Leverkusen, and Helmut Woynar, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 3, 1996, Ser. No. 723,659

Claims priority, application European Pat. Off., Oct. 10, 1995, 95115940

Int. Cl.[6] C08F *283/02*

U.S. Cl. 525—53 **17 Claims**

1. A continuous process for the preparation of highly stable, finely divided, low viscosity polymer polyols having a small average particle size comprising

a) forming an intermediate in a first reactor by polymerizing (1) a mixture of at least two ethylenically unsaturated monomers, in a mixture comprising (2) a base polyol and (3) a macromer, in the presence of (4) a free radical initiator, (5) a solvent, and, optionally, (6) a reaction moderator at a temperature of at least 100° C., wherein the resultant intermediate has a macromer content of at least about 12% by weight, based on the total weight of the base polyol and the macromer, a solids content of at least about 15% and less than about 30% by weight, based on the total weight of the base polyol, the macromer and the monomers, and contains less than 45% by weight of base polyol, based on the total weight of the base polyol, and

b) polymerizing said intermediate in at least a second stirred-tank reactor connected in series to the first reactor, with (1) a mixture of at least two ethylenically unsaturated monomers, in (2) a base polyol and, optionally, (3) a macromer, in the presence of (4) a free radical initiator, (5)a solvent, and (6) a reaction moderator, wherein components (1) through (6) are distributed among the second and any successive reactors.

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5,814,700

METHOD FOR POLYMER SYNTHESIS IN A REACTION WELL

Thomas M. Brennan, San Francisco, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 142,593, Oct. 22, 1993, Pat. No. 5,472,672. This application May 30, 1995, Ser. No. 453,972

Int. Cl.[6] C07K *1/04*

U.S. Cl. 525—54.11 **10 Claims**

1. A method of synthesis for building a polymer chain by sequentially adding polymer units to at least one solid support for growing and immobilizing a polymer chain thereon in a liquid reagent solution, said method comprising the steps of:

A) dripping droplets of a liquid reagent into an open top end of a reaction well in contact with at least one solid support and at least one polymer unit of said polymer chain affixed to said solid support, said well having at least one orifice extending downwardly from said open top end into said well, and being of a size and dimension to form a capillary liquid seal at a bottom end of said well to retail said reagent solution in said well to enable polymer chain growth on said solid support; and

B) expelling said reagent solution from said bottom end of said well, while retaining said polymer chain therein, by applying a first gas pressure to said reaction well such that a pressure differential between said first gas pressure and a second gas pressure exerted on an exit of said orifice exceeds a predetermined amount sufficient to overcome said capillary liquid seal and expel said reagent solution from said well through the orifice exit.

5,814,701

PROCESS FOR THE PRODUCTION OF WATER SOLUBLE MODIFIED ROSIN ESTER VEHICLES FOR LAMINATING INKS

Robert J. Catena, 78 Plenge Dr., Belleville, N.J. 07109; Mathew C. Mathew, 24 Bryant Ave., Bloomfield, N.J. 07003, and Albert A. Kveglis, 7 Buckingham Cir., Pine Brook, N.J. 07058

Continuation-in-part of Ser. No. 190,624, Feb. 2, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 536,014

Int. Cl.[6] C08G *63/48*

U.S. Cl. 525—54.44 **4 Claims**

1. An improved method for preparing a water soluble resin binder wherein the preparation requires reacting a rosin with a dienophile and a polyfunctional hydroxy compound to form an ester and reacting said ester with an acrylic-containing copolymer; wherein said improvement comprises:

using an acrylic-containing copolymer having an acid number greater than 180 wherein the weight ratio of the rosin reaction product to the acrylic copolymer is between 1:2 and 1.5:1; thereby enhancing the water solubility of the resin binder having an acid number of between 157 and 175.

5,814,702

ELASTOMER COMPOSITION AND THERMOPLASTIC RESIN COMPOSITION MODIFIED THEREWITH

Roger W. Avakian, and Roman W. Wypart, both of Parkersburg, W. Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 20, 1996, Ser. No. 604,039

Int. Cl.[6] C08L *53/02;51/04*

U.S. Cl. 525—71 **19 Claims**

1. An elastomer composition comprising:

(a) a vinyl aromatic-conjugated diene block copolymer; and

(b) a high rubber graft copolymer, wherein said graft copolymer comprises:

(i) from 60 percent by weight to 95 percent by weight of a rubbery polymeric substrate having a glass transition temperature of less than 0° C. and consisting essentially of repeating units derived from one or more (C_1–C_{12})acrylate monomers; and

(ii) from 5 percent by weight to 40 percent by weight of a rigid polymeric superstrate having a glass transition temperature of greater than or equal to 0° C. and consisting essentially of repeating units derived from one or more (C_1–C_{12})alkyl (meth)acrylate monomers, wherein at least a portion of the rigid polymeric superstrate is grafted to the rubbery polymeric substrate; and

wherein the composition comprises from 30 to 70 percent by weight of the block copolymer and from 30 to 70 percent by weight of the graft copolymer.

5,814,703

COATING COMPOSITION

Masaaki Yamaya, Takasaki, and Masahiro Yoshizawa, Annaka, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1996, Ser. No. 698,842

Claims priority, application Japan, Aug. 17, 1995, 7-232030

Int. Cl.[6] C08L *83/04;33/04;63/00;67/00*

U.S. Cl. 525—103 **13 Claims**

1. A coating material composition comprising:

(A) an organic resin, and

(B) a silicone compound represented by the average composition formula (1):

$$(X)_a(Y')_b(R^1)_cSiO_{(4-a-b-c)/2} \quad (1)$$

wherein X is an organic group containing at least one functional group selected from the group consisting of an epoxy group, a mercapto group, an acryloyl group, a methacryloyl group, an alkenyl group, a haloalkyl group and an amino group, Y' is a hydrolyzable group consisting of an organic group having a terminal oxygen atom, the organic group being bonded to a silicon atom at the terminal oxygen atom or an admixture of a hydrolyzable group consisting of an organic group having a terminal oxygen atom, the organic group being bonded to a silicon atom at the terminal oxygen atom and the silanol group, said silanol group amounting to 20 mole % or less of the Y', R^1 is a monovalent hydrocarbon group, a is a number of 0.05 to 0.90, b is a number of 0.12 to 1.88, and c is a number of 0.10 to 1.00, a+b+c being in the range of 2.02 to 2.67, containing silicon atoms to which said functional group-containing organic group X is bonded in an amount of 5 to 90 mol % based on the entire silicon atoms in the molecule, containing the T unit represented by $R^113\ SiO_{3/2}$ in an amount of 10 to 95 mole % based on the entire siloxane units in the molecule, and having an average polymerization degree of 3 to 100, the oxygen atom of the T unit represented by $R—SiO_{3/2}$ including not only the oxygen atoms constituting siloxane linkage but also the oxygen atoms of Si-bonded hydroxyl group and those of the organic groups which are bonded to silicon atoms at their terminal oxygen atoms.

5,814,704

RECOVERY OF POLYPHOSPHAZENE POLYACIDS OR ACIDS SALTS THEREOF

Alexander K. Andrianov, Belmont, Mass.; Jonathan R. Sargent, Los Angeles, Calif., and Sameer S. Sule, Marlboro, Mass., assignors to Virus Research Institute, Inc., Cambridge, Mass.

Filed Mar. 4, 1997, Ser. No. 810,728

Int. Cl.[6] C08L *43/02*

U.S. Cl. 525—209 **12 Claims**

1. A process for recovering a polyphosphazene acid or acid salt obtained by hydrolyzing a polyphosphazene having at least one ester moiety present in at least one substituent group, said process comprising:

(i) hydrolyzing said polyphosphazene, having at least one ester moiety present in at least one substituent group, with a base, in an organic solvent in the presence of water, to a corresponding acid or acid salt, and agglomerating said acid or acid salt by providing water in the water-organic solvent mixture in an amount of from about 1% (v/v) to about 50% (v/v), whereby there is formed a solid phase including said polyphosphazene acid or acid salt and a liquid organic phase including said organic solvent; and

(ii) separating said liquid organic phase and said agglomerated polyphosphazene acid or acid salt.

5,814,705

COMPOSITIONS THAT SOFTEN AT PREDETERMINED TEMPERATURES AND THE METHOD OF MAKING SAME

Robert S. Ward, Lafayette, and Judy S. Riffle, Oakland, both of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Division of Ser. No. 19,248, Feb. 18, 1993, Pat. No. 5,506,300, which is a continuation of Ser. No. 516,617, Apr. 30, 1990, abandoned, which is a continuation of Ser. No. 918,521, Oct. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 688,793, Jan. 4, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 478,261

Int. Cl.[6] C08L *75/06;75/08;75/04*

U.S. Cl. 525—88 **49 Claims**

1. An article with shape-memory properties made by a method comprising the steps of forming a composition comprising at least one block copolymer and a polymer or plasticizer into a first configuration,

(i) said polymer or plasticizer being selected from the group consisting of polyvinylchloride, styreneacrylonitrile copolymers, polyhydroxyethers, polycarbonates, polyesters, polyethers, nitrocellulose, cellulose and polystyrene and being thermodynamically compatible with at least one block of said block copolymer and having at least one glass transition temperature;

(ii) said blocks of said block copolymer being selected from the group consisting of polyester urethanes, polyether urethanes, polyurethane/ureas, polyetherpolyamides and polyetherpolyesters;

(iii) said composition being characterized by at least two thermal transition temperatures, one of said composition transition temperatures being a predetermined lower glass transition temperature in the range of about 20° C. to about 62° C., the other of said composition transition temperatures being an upper glass transition temperature or melting point above about 62° C., said composition being further characterized by being rigid below said composition predetermined lower glass transition temperature and by being flexible at and above said composition predetermined lower glass transition temperature but below said composition upper glass transition temperature or melting point,

bringing said composition in said first configuration to a temperature at or above said composition lower glass transition temperature, orienting said composition under stress into a second configuration, cooling said composition to below said composition predetermined lower glass transition temperature while said composition is in said second configuration so that said composition becomes rigid in said second configuration.

5,814,706

POLYMERIC DISPERSANTS VIA NOVEL TERPOLYMERS

Daniel Y. F. Yu, Columbus, Ind., and Carl A. Mike, Chesterfield, Va., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 748,881, Nov. 14, 1996, Pat. No. 5,733,993. This application Dec. 23, 1997, Ser. No. 997,347

Int. Cl.[6] C08F *8/32*

U.S. Cl. 525—327.6 **14 Claims**

1. An oil soluble dispersant additive useful in oleaginous compositions comprising a product prepared by contacting (i) a terpolymer comprising an unsaturated acidic reactant, a high molecular weight olefin, and a di-or poly-unsaturated compound, said unsaturated acidic reactant comprising at least one unsaturated C_4 to C_{10} carboxylic acid or anhydride, or acid derivative, said high molecular weight olefin is derived from the oligomerization or polymerization of at least one C_2 to C_{10} alpha olefin monomer, wherein at least 50% of the high molecular weight olefin has polymer chains containing terminal vinylidene unsaturation, and wherein the high molecular weight olefin has a number average molecular weight from about 300 to 6,000 with (ii) at least one nucleophilic reagent selected from the group consisting of amines, alcohols, metal reactants and mixtures thereof under conditions effective to form adducts of the nucleophilic reagent with the terpolymer.

5,814,707

PROCESS FOR OXIDATIVE FUNCTIONALIZATION OF POLYMERS CONTAINING ALKYLSTYRENE

Jean M.J. Fréchet, Ithica, N.Y.; Shah A. Haque, Houston, and Hsien-Chang Wang, Bellaire, both of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Division of Ser. No. 628,416, Apr. 5, 1996, Pat. No. 5,679,748. This application Jun. 4, 1997, Ser. No. 868,544

Int. Cl.[6] L08F *8/00*

U.S. Cl. 525—333.3 **3 Claims**

1. A composition comprising an isoolefin-mono or dialkylstyrene-vinyl phenyl ketone terpolymer, wherein the ketone is a mono or di ketone.

5,814,708

PROCESS FOR OXIDATIVE FUNCTIONALIZATION OF POLYMERS CONTAINING ALKYLSTYRENE

Jean M.J. Fréchet, Ithica, N.Y.; Shah A. Haque, Houston, and Hsien-Chang Wang, Bellaire, both of Tex., assignors to Exxon Chemical Patents Inc., Houston, Tex.

Division of Ser. No. 628,416, Apr. 5, 1996, Pat. No. 5,679,748. This application Jun. 4, 1997, Ser. No. 868,548

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—333.3 **2 Claims**

1. A polymer having a molecular weight of about 80,000 or greater comprising isobutylene-paramethylstyrene-paracarbonylstyrene monomeric units.

5,814,709

PROCESS FOR HYDROGENATION ON CONJUGATAED DIENE POLYMERS AND CATALYST COMPOSITION SUITABLE FOR USE THEREIN

Eric Johannes Maria De Boer; Bart Hessen; Adriaan Albert Van Der Huizen; Wouter De Jong; Adrianus Johannes Van Der Linden; Bart Johan Ruisch; Lodewijk Schoon; Heleen Johanna Augusta De Smet; Frederik Hendrik Van Der Steen; Hubertus Cornelis Thomas Lucianes Van Strien; Alan Villena, and Judith Johanna Berendina Walhof, all of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 9, 1997, Ser. No. 831,631

Claims priority, application European Pat. Off., Apr. 12, 1996, 96302600

Int. Cl.[6] C08F *8/04*

U.S. Cl. 525—337 **14 Claims**

1. A catalyst composition usable for hydrogenation of polymers containing ethylenic unsaturation, which comprises:

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(a) a titanium compound of the formula,

wherein A_1 and A_2 are the same or different and each represents a substituted or unsubstituted cyclopentadienyl or indenyl group,

wherein X_1 and X_2 are the same or different and each represents hydrogen, halogen, a lower alkyl or lower alkoxy, optionally substituted phenyl or phenoxy, or aralkyl having from 7 to 10 carbon atoms, or phenylalkoxy having from 7 to 10 carbon atoms, carboxyl, carbonyl, a $—CH_2P(Phenyl)_2$, $—CH_2Si(lower\ alkyl)_3$ or $—P(phenyl)_2$ group

(b) an alkalimetal hydride, the molar ratio of the alkali metal:titanium being at least 2:1; and

(c) a borium compound of the formula,

$B(R_1)(R_2)(R_3)$

wherein the symbols R_1, R_2 and R_3 may be the same or different and each may represent hydrogen, halogen, lower alkyl or lower alkoxy, or phenyl optionally substituted by up to five substituents selected from halogen and lower alkyl, or benzyl having an optionally substituted phenyl ring or wherein two of the symbols R may form together a monocyclic or bicyclic system which on its own may carry one or more substituents.

5,814,710

PROCESS FOR SELECTIVE HYDROGENATION OF UNSATURATED POLYMERS

Petri Rekonen; Nina Kopola; Salme Koskimies; Ove Andell, and Marita Oksman, all of Helsinki, Finland, assignors to Neste Oy, Provoo, Finland

PCT No. PCT/FI95/00120, § 371 Date Dec. 4, 1996, § 102(e) Date Dec. 4, 1996, PCT Pub. No. WO95/25130, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 3, 1995, Ser. No. 704,656

Claims priority, application Finland, Mar. 14, 1994, 941189

Int. Cl.[6] C08F *8/04*

U.S. Cl. 525—332 **14 Claims**

1. A method for the selective hydrogenation of polymers which contain aromatic and olefinic carbon-carbon double bonds which comprises selectively hydrogenating said polymers in the presence of a catalyst comprised of a metallocene compound and alumoxane, the metallocene compound in the composition being in accordance with Formula (I):

$$Ar_2ZrR_2 \qquad (I)$$

where Ar is a substituted or unsubstituted cyclopentadienyl or indenyl group and R is a halogen, a lower alkyl or benzyl group.

5,814,711

POLYMERIZATION MEDIUM TO PREPARE MULTI-BLOCK COPOLYMERS

Eui Won Choe, Randolph, N.J.; Masayuki Arai, Hofheim, Germany, and Marie Borzo, Basking Ridge Township, N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 5, 1996, Ser. No. 761,108

Int. Cl.[6] C08L *77/388*

U.S. Cl. 525—431 **14 Claims**

1. A process to prepare a multi-block copolymer comprising a wholly aromatic polyamide and a polydimethylsiloxane wherein said copolymer has an η_{inh} of 0.45 or more when measured in N,N-dimethylacetamide at a concentration of 0.5 g dl^{-1} at 30° C., the process comprising: reacting, for about 1–20 hours at about −20° to 40° C. with optional agitation, a wholly aromatic polyamide segment containing a first set of reactive end groups with a polydimethylsiloxane segment containing a second set of reactive end groups, in a solvent mixture which comprises a first solvent selected from the group consisting of N-methyl-2-pyrrolidinone, N,N-dimethylformamide, N,N-dimethylacetamide, and N,N,N'N'-tetramethylurea, and a second solvent selected from the group consisting of diglyme, tetrahydrofuran, a crown ether and tetrahydropyran in a 20:80 to 80:20 volume/volume ratio, wherein said first set of reactive end groups and said second set of reactive end groups are capable of reacting with each other in said solvent mixture.

5,814,712

IMPACT-MODIFIED THERMOPLASTICS RESIN MOLDING COMPOSITIONS AND ARTICLES MOLDED THEREFROM

Robert Russell Gallucci; Paul Joseph Hans, both of Mt. Vernon, Ind.; Joseph Maria Henri Janssen, Bergen op Zoom, Netherlands; Woodie Daniel Mordecai, and Matthew Robert Pixton, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 25, 1996, Ser. No. 637,953

Int. Cl.[6] C08L *77/06*

U.S. Cl. 525—436 **16 Claims**

1. A method for making an impact modified thermoplastic resin composition, comprising:

combining a glycidyl ester impact modifier with a polycarbonate resin to form a glycidyl ester impact modifier/polycarbonate resin blend;

said glycidyl ester impact modifier/polycarbonate resin blend consisting essentially of from 50 to 95 parts by weight polycarbonate resin and from 5 to 50 parts by weight of said glycidyl ester impact modifier; and

combining the glycidyl ester impact modifier/polycarbonate resin blend with a polyester resin to provide the impact modified thermoplastic resin composition.

5,814,713

METHOD FOR EMULSION POLYMERIZATION OF TETRAFLUOROETHYLENE AND METHOD FOR PREVENTION OF IRREGULAR POLYMERIZATION THEREOF

Takuo Kawamura; Shigeru Ichiba, and Tomizo Sota, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP96/03527, § 371 Date Aug. 6, 1997, § 102(e) Date Aug. 6, 1997, PCT Pub. No. WO97/20863, PCT Pub. Date Jun. 12, 1997

PCT Filed Dec. 3, 1996, Ser. No. 875,886

Claims priority, application Japan, Dec. 6, 1995, 7-318266

Int. Cl.[6] C08F *2/00*

U.S. Cl. 526—210 **21 Claims**

1. A method for emulsion polymerization of tetrafluoroethylene and optionally a monomer for modifying polytetrafluoroethylene which comprises conducting the polymerization in the presence of a polymerization initiator, a paraffin wax and an emulsifier, wherein the paraffin wax contains a reducing substance in an amount of not larger than 100 ppm based on the paraffin wax.

5,814,714

MONO-OLEFIN/POLYENE INTERPOLYMERS, METHOD OF PREPARATION, COMPOSITIONS CONTAINING THE SAME, AND ARTICLES MADE THEREOF

Jesus Nieto Palomo, Cambrils, Spain; Patrick J. C. Schouterden, Wachtebeke, Belgium; Debra Jean Mangold, Lake Jackson, Tex.; Lambertus P. P. M. van der Heijden, Terneuzen, Netherlands, and Miguel Garcia Marti, Blankenberge, Belgium, assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 30, 1995, Ser. No. 565,329

Int. Cl.[6] C08F *236/20;4/64*

U.S. Cl. 526—336 **39 Claims**

1. An interpolymer comprising in polymerized form ethylene, an α-olefin containing 3 to 18 carbon atoms, and a non-conjugated α-omega diene having at least 7 carbon atoms and having two readily polymerizable double bonds, the amount of α-olefin containing 3 to 18 carbon atoms in the interpolymer being up to about 17 mole percent and the amount of non-conjugated diene in the interpolymer being from 0.005 to 0.7 mole percent,

said interpolymer having a density, d, of from 0.85 to 0.97 g/cm^3 as measured in accordance with ASTM D-792;

a melt flow rate, I_2, from 0.001 to 50 g/10 min as measured in accordance with ASTM D-1238, Condition 190° C./2.16 kg; and

the melt tension of the interpolymer satisfying the following relationship:

$$MT>1.328-0.7879\log(I_2)+22.5(d-0.85)-40.56\{\log(I_2)\}\times(d-0.85)$$

wherein MT represents the melt tension in g.

29. A process of preparing an interpolymer comprising in polymerized form ethylene, an α-olefin containing 3 to 18 carbon atoms, and a non-conjugated α-omega diene having at least 7 carbon atoms and having two readily polymerizable double bonds, the amount of α-olefin containing 3 to 18 carbon atoms in the interpolymer being up to about 17 mole percent and the amount of non-conjugated diene in the interpolymer being from 0.005 to 0.7 mole percent, by interpolymerizing in a polymerization reactor ethylene, the α-olefin containing 3 to 18 carbon atoms and the diene in the presence of a transition metal catalyst comprising a transition metal compound containing at least one π-bonded anionic ligand group, wherein the molar ratio of diene to ethylene in the feed to said polymerization reactor is from 0.00005 to 0.02.

5,814,715

AMORPHOUS OLEFIN POLYMERS, COPOLYMERS, METHODS OF PREPARATION AND DERIVATIVES THEREOF

Frank Joung-Yei Chen, Edison; Jon Edmond Randolph Stanat, Westfield, and Cezar S. Baula, Edison, all of N.J., assignors to Exxon Chemical Patents Inc, Linden, N.J.

Continuation of Ser. No. 992,871, Dec. 17, 1992, abandoned. This application May 5, 1997, Ser. No. 851,226

Int. Cl.[6] C08F *10/08;10/14*

U.S. Cl. 526—348.6 **27 Claims**

1. Amorphous poly-n-butene having a number average molecular weight of from about 1,200,000 to about 15,000,000 and being at least 95% amorphous.

5,814,716

CELL LINES FROM A TRANSGENIC MOUSE WHICH EXPRESS BIOLOGICALLY ACTIVE IX FACTOR

Sophie Jallat, Strasbourg; Pierre Meulien, Paris; Andréa Pavirani, and Frédéric Perraud, both of Strasbourg, all of France, assignors to Transgene S.A., Courbevole, France

Continuation of Ser. No. 38,085, Mar. 29, 1993, abandoned, which is a continuation of Ser. No. 675,889, Apr. 9, 1991, abandoned. This application Feb. 24, 1995, Ser. No. 394,210

Claims priority, application France, Aug. 9, 1989, 89 10720

Int. Cl.[6] C12N *5/00;15/00;* **C12P** *21/04*

U.S. Cl. 800—2 **12 Claims**

1. A transgenic mouse which develops a liver tumor, wherein the tumor produces biologically active human factor IX, said mouse having integrated into its genome:

(i) a first exogenous DNA sequence encoding human factor IX, wherein said DNA sequence is genomic DNA, and where expression of said DNA sequence is controlled by a promoter region specific for hepatic cells, wherein said promoter region is the factor IX gene promoter or a portion thereof sufficient to provide for expression of said DNA sequence; and

(ii) a second exogenous DNA sequence encoding an oncogene, wherein said oncogene is selected from the group consisting of the SV40 virus gene encoding T-antigen and the mouse c-myc gene, where expression of the said DNA sequence is controlled by a promoter region specific for hepatic cells,

wherein said promoter region is an α-1 antitrypsin gene promoter,

wherein a cell line comprising TMhepTG48 is established from said mouse.

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5,814,717

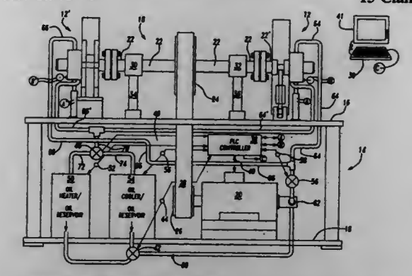
OIL SEAL TESTER

Joseph Antonini, Chicago, Ill.; Mark Shuster, Sylvania, Ohio, and David Sverdlik, Morton Grove, Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 31, 1996, Ser. No. 777,662

Int. Cl.[6] G01N *3/56*

U.S. Cl. 73—9 **15 Claims**



1. An oil seal tester, comprising:

a moving shaft for engaging an oil sealing surface of an oil seal, at least one source of fluid to be applied against the moving shaft and against a first side of said oil seal, a force measuring device for measuring the force imparted to said oil seal from said moving shaft;

a seal mounting housing for securing said oil seal; and

a base plate having at least two rotating members for rotatingly coupling the seal mounting house to the base plate, wherein said base plate includes at least one sealing ring encircling an outside perimeter of said seal mounting housing for forming a low friction fluid seal between said base plate and said seal mounting housing.

5,814,718

METHOD AND APPARATUS FOR MEASURING OR CONTROLLING FRICTION

Arild Andresen, Oslo; Oddvard Johnsen, Lier, both of Norway, and Zoltan Rado, Györ, Hungary, assignors to Norsemeter A/S, Rud, Norway

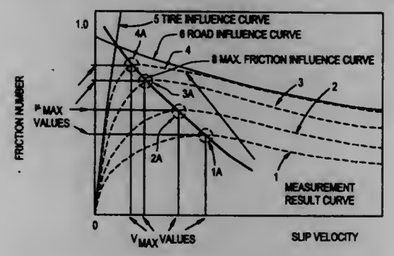
PCT No. PCT/NO95/00206, § 371 Date May 2, 1997, § 102(e) Date May 2, 1997, PCT Pub. No. WO96/14564, PCT Pub. Date May 17, 1996

PCT Filed Nov. 3, 1995, Ser. No. 836,601

Claims priority, application Norway, Nov. 4, 1994, 944227

Int. Cl.[6] G01N *19/02*

U.S. Cl. 73—9 **15 Claims**



1. Method for measuring or controlling friction relationships when a pneumatic rubber wheel and a surface interact during rolling motion under slip conditions between the wheel and the surface, comprising

continuous measurement of the linear velocity v of the wheel axle in relation to the surface and continuous measurement of the rotational velocity of the wheel within an acceleration or deceleration time interval during the rolling motion of the wheel in relation to the surface,

calculation of a corresponding, varying slip speed V_s from said linear velocity v being measured and said rotational velocity being measured while taking the wheel radius into account, and

calculation of friction relationships occuring during said time interval,

characterized in that measurement values or control parameters relating to said friction relationships are calculated as a function of the varying slip speed V_s and the linear velocity v on the basis of the following relation(s):

$$\mu_{max}=-f+g\cdot STDslope-h\cdot A_r\,(v,V_s)$$

where μ_{max} is the maximum friction value

STDslope is standard deviation of the surface texture slope angles, as measured for example with a known measurement method,

A (v,V_s) is the real or total contact area between the wheel and the surface, as a function of the velocities v and V_s

and

$$A_r(v,V_s)=\frac{D}{2-D}\;\frac{2\sigma\tau^2}{\pi G^{d-1}\eta}\cdot\left[e^{-\frac{b\delta}{r}}\;\frac{V_s}{V}+\frac{b\delta}{r}\;\frac{V_s}{v}-1\right]\left[\frac{L^{(1-D)}-l^{(1+D)}}{1+D}\right]$$

where

D=fractal dimension

G=fractal scaling factor

L=upper wave length cut-off limit for a chosen number of sinusoidal waves

L=lower wave length cut-off limit for a chosen number of sinusoidal waves

σ=stress-factor for the rubber wheel

τ=the rubber wheel relaxation spectra

η=the rubber wheel viscosity

δ=rubber wheel shape-factor

b=the length of the contact area between the wheel and the surface

r=the rubber wheel radius

and where f, g and h are constants.

5,814,719

LIMITING CURRENT TYPE OXYGEN SENSOR

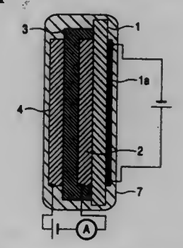
Takayuki Suzuki; Hozumi Futata, both of Shizuoka; Koji Moriya; Takahiro Sako, both of Osaka; Hideaki Takahashi, and Keiichi Saji, both of Aichi, all of Japan, assignors to Yazaki Corporation, Tokyo, and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of Japan

Filed Jan. 24, 1997, Ser. No. 788,758

Claims priority, application Japan, Jan. 26, 1996, 8-011674

Int. Cl.[6] G01N *27/00*

U.S. Cl. 73—23.31 **5 Claims**



1. An oxygen sensor of a limiting current type, comprising:

a sensing element including a substrate, a first electrode, a solid electrolyte layer, and a second electrode; and

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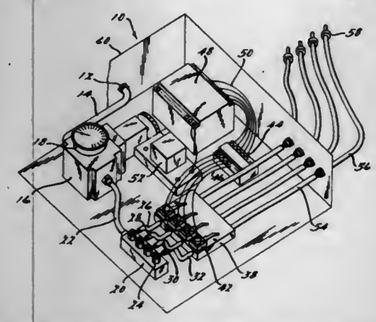
a porous coating layer supporting a catalyst thereon and coating said sensing element, wherein said catalyst comprises at least one element selected from the group consisting of platinum, rhodium, palladium, iridium, and ruthenium, and the content of said catalyst is 10 to 50 wt % with respect to the total weight of said porous coating layer, and particles of said catalyst are dispersed within said porous coating layer at spacings of not more than 6 μm.

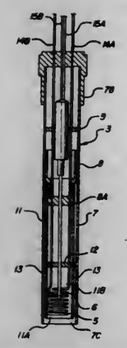
5,814,720
AIR PRESSURE SENSOR CONTROL SYSTEM
Paul R. Visscher, 6283 136th Ave., Saugatuck, Mich. 49453
Filed Feb. 18, 1997, Ser. No. 802,390
Int. Cl.[6] G01M *3/02*
U.S. Cl. 73—37 **20 Claims**



1. An air pressure sensor control system comprising, in combination, an electro-pneumatic interface module defining a main air passageway and a secondary air passageway communicating with said main air passageway intermediate the ends thereof, means connecting one end portion of said main air passageway to a source of low pressure air, means connecting the other end portion of said main air passageway to sensor probe means defining a first orifice, said sensor probe means being effective to perform a double function of sensing predetermined criteria respecting a workpiece and also perform a manufacturing operation on a workpiece, electro-pneumatic switch means communicating with the end portion of said secondary air passageway remote from said main air passageway and operable to open and close an electrical circuit as a function of variations in the air pressure in said secondary air passageway, variations in the pressure in said secondary air passageway being effected by the opening, closing or restriction of the passage of air through said first orifice defined by said probe means.

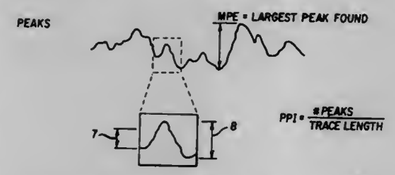
5,814,721
FLUID BOILING POINT ANALYZER
Lionel William Mills, Kinghorn, Scotland, assignor to Alba Tools Limited, Glenrothes, Scotland
PCT No. PCT/GB95/01060, § 371 Date Nov. 11, 1996, § 102(e) Date Nov. 11, 1996, PCT Pub. No. WO95/30899, PCT Pub. Date Nov. 16, 1995
PCT Filed May 10, 1995, Ser. No. 737,566
Claims priority, application United Kingdom, May 10, 1994, 9409296
Int. Cl.[6] G01N *25/08;33/28*
U.S. Cl. 73—53.01 **12 Claims**

1. An apparatus for use in indicating the boiling point of fluids across a wide temperature range which apparatus comprises a meter of the portable hand held type including a probe portion for insertion substantially vertically into fluid in a fluid reservoir for fluid testing, heating means being provided in the probe portion for



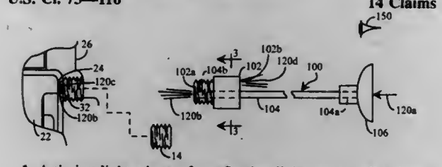
heating of said fluid, said meter including monitoring means for monitoring the temperature rise of fluid heated by said heating means for use in indicating the boiling point temperature of the fluid, said probe portion having an inner chamber, in which are located said heating means and said temperature monitoring means, said inner chamber being provided with thermal insulation means for restricting heat loss from said inner chamber, in use of the apparatus, during heating up of said fluid in the inner chamber up to its boiling point, said inner chamber being provided with port means formed and arranged so as to provide a fluid flow barrier means operable, in use of the apparatus, to allow entry of fluid into said inner chamber upon immersion of the probe portion into said fluid for semi-encapsulation of fluid in the inner chamber, and to substantially prevent loss of heated fluid therefrom to the exterior during said heating up of said fluid in the inner chamber up to its boiling point, whilst allowing a substantial loss of boiling fluid to the exterior so as to provide a substantially steady flow of fluid through said inner chamber with a controlled exchange of fluid between the inner chamber and the reservoir thereby substantially increasing heat loss from said inner chamber once said fluid has been heated to its boiling point, whereby fluid in said inner chamber may be boiled steadily without overheating.

5,814,722
SYSTEM FOR MEASUREMENT OF PEAKS ON SURFACES
Steven M. Pratt, Hilton, and Edwin R. Olear, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 17, 1997, Ser. No. 783,925
Int. Cl.[6] G01B *7/34*
U.S. Cl. 73—105 **2 Claims**



1. A method of determining the characteristics of a surface of a material comprising sensing peaks in said surface and counting peaks wherein the short leg is above the height of a threshold window wherein when a direction change in amplitude is located, the size of the change is compared to the threshold and when these changes locate a peak leg, a valley and a peak leg, one peak is counted and the height of the larger of the two legs is recorded and this process is repeated along the entire set of data.

5,814,723
TIMING LIGHT ADAPTER
Ted W. Berardinelli, 3622 SE. 49th Ave., Portland, Oreg. 97206
Filed Jan. 24, 1997, Ser. No. 788,581
Int. Cl.[6] G01M *15/00*
U.S. Cl. 73—116 **14 Claims**

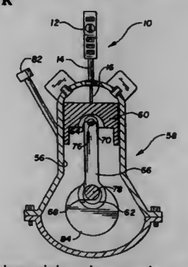


1. A timing light adapter for reflecting light energy off a timing mark of an internal combustion motor, said timing light adapter comprising:

a first light transmissive body having a proximal end and a distal end, said light transmissive body defining a first light transmissive channel carrying light energy between said proximal and distal ends thereof; and

a second light transmissive body having a proximal end and a distal end, said second light transmissive body defining a second light transmissive channel carrying light energy between said proximal and distal ends thereof, said first and second light transmissive bodies being coupled together while maintaining said first and second light transmissive channels substantially independent of light energy interference therebetween whereby, upon positioning said proximal end of said first light transmissive body adjacent said timing mark and upon positioning said proximal end of said second light transmissive body adjacent said timing mark, light energy injected into said distal end of one of said first and second light transmissive channels travels therealong, emerges at said proximal end of said one of said first and second light transmissive channels, strikes said timing mark, reflects off said timing mark, enters said proximal end of the other one of said first and second light transmissive channels and travels therealong, and emerges from said distal end of said other one of said first and second light transmissive channels, said first and second light transmissive bodies as coupled together providing a plug for insertion into an engine case of said motor to seal said case against escape of oil within said case while said motor operates.

5,814,724
METHOD AND DEVICE FOR DETERMINING PISTON ENGINE WEAR
David Scott Romkee, 1700 Chestnut St., Santa Clara, Calif. 95054
Filed Dec. 13, 1996, Ser. No. 767,996
Int. Cl.[6] G01M *15/00*
U.S. Cl. 73—119 R **14 Claims**



1. A device for determining piston engine wear comprising:

a sensor for determining the position of a piston within a cylinder of a piston engine, said sensor outputting a signal indicative of the position of the piston;

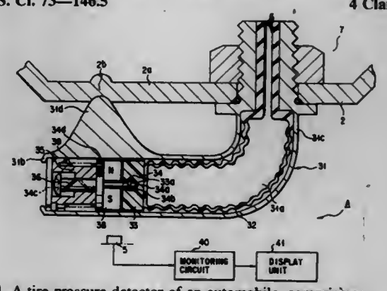
an internal computer in communication with said sensor, said internal computer including

means for calculating a rate of rotation of the piston engine by analyzing the signal output by said sensor to determine a periodic rate of recurrence of a period of time during each cycle of the engine during which the piston is motionless,

means for calculating a duration of the period of time the piston is motionless by analyzing the signal output by said sensor, and

means for calculating free play of the piston relative to an element of the piston engine connected to a connecting rod which is in turn connected to the piston based on the duration of the period of time the piston is motionless and the rate of rotation of the piston engine.

5,814,725
TIRE PRESSURE DETECTING APPARATUS AND MONITORING APPARATUS
Kenji Furuichi, Tokyo; Moritaka Goto, Chiba; Masaaki Yamamoto, Kamagaya; Saiichiro Ohshita, and Kazutoshi Fukada, both of Ota, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan
Continuation of Ser. No. 598,231, Feb. 7, 1996, abandoned. This application Aug. 13, 1997, Ser. No. 910,785
Claims priority, application Japan, Feb. 8, 1995, 7-020832; Feb. 8, 1995, 7-020833
Int. Cl.[6] B60C *23/02*
U.S. Cl. 73—146.5 **4 Claims**



1. A tire pressure detector of an automobile, comprising:

a magnet having N and S poles and rotated by a pneumatic pressure in a tire to revolve the N and S poles;

detecting means, arranged opposite to the magnet, for detecting magnetism and outputting a voltage signal changed to different magnetism level in accordance with rotation of the magnet; and

determining means for comparing the voltage signal with a positive or negative threshold value and determining whether the pneumatic pressure in the tire is within a suitable range, based on a polarity of the voltage signal represented by a comparison result.

5,814,726
METHOD FOR DETERMINING THE ABSOLUTE HUMIDITY OF AIR
Helmut Mitter, Hellmansödt, Austria, assignor to E & E Elektronik Gesellschaft M.B.H., Austria
Filed Mar. 12, 1997, Ser. No. 816,948
Claims priority, application Austria, Apr. 10, 1996, GM 202/96
Int. Cl.[6] G01N *33/18;* **G01R** *27/22*
U.S. Cl. 73—335.04 **9 Claims**

1. In a method for determining the absolute humidity of air by aid of a sensor means comprising a capacitive sensor and a temperature sensor as well as a heating element by providing a

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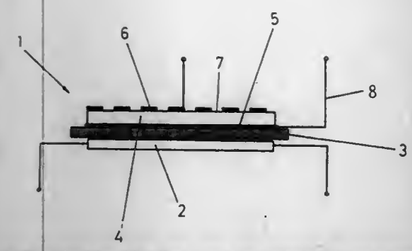


predetermined humidity limit value and changing the temperature of said capacitive sensor upon reaching said predetermined humidity limit value, the improvement comprising the steps of

measuring the capacity of said capacitive sensor so as to obtain a capacity value,

determining the humidity of air until reaching said predetermined humidity limit value by evaluating said capacity value,

upon reaching said predetermined humidity limit value, controlling the temperature of said sensor means so as to maintain a constant capacity value of said capacitive sensor by heating said capacitive sensor, and

evaluating said temperature.

5,814,727

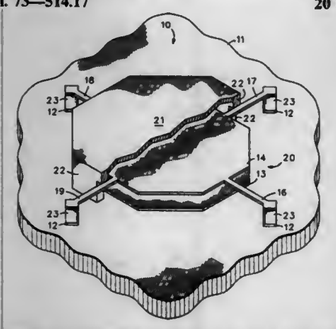
SEMICONDUCTOR ACCELEROMETER HAVING REDUCED SENSOR PLATE FLEXURE

Asher T. Matsuda, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 8, 1993, Ser. No. 148,307

Int. Cl.[6] G01P *15/13;15/125*

U.S. Cl. 73—514.17 **20 Claims**



1. A planar semiconductor accelerometer sensor plate comprising:

a first mass of the sensor plate bounded by a plurality of constraint points, wherein the first mass is disposed inside the plurality of constraint points; and

a second mass of the sensor plate cantilevered from the first mass in order to produce a counterbalancing moment on the first mass, wherein the second mass is disposed outside the plurality of constraint points for restoring the sensor plate to a substantially planar condition in response to acceleration forces.

5,814,728

NONDESTRUCTIVE INSPECTION METHOD OF POLYMER INSULATOR AND APPARATUS FOR PERFORMING THE SAME

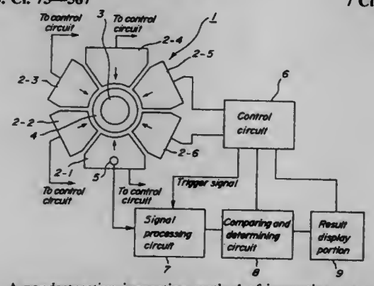
Yasushi Okawa, Kasugai; Itsushi Nakamura, Nagoya; Tomio Suzuki, Yokkaichi, and Masahiro Hori, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 27, 1997, Ser. No. 824,954

Claims priority, application Japan, Mar. 28, 1996, 8-073686; Nov. 8, 1996, 8-296217

Int. Cl.[6] G01N *29/14*

U.S. Cl. 73—587 **7 Claims**



1. A nondestructive inspection method of inspecting a securing defect of a polymer insulator having an FRP core, an outer cover portion arranged around said FRP core, and at least one metal member secured to at least one end of said FRP core, comprising the steps of;

measuring an acoustic emission signal generated when said metal member is secured to said FRP core by using compression dies; and

determining whether or not said securing defect is generated on the basis of said acoustic emission signal in process.

5,814,729

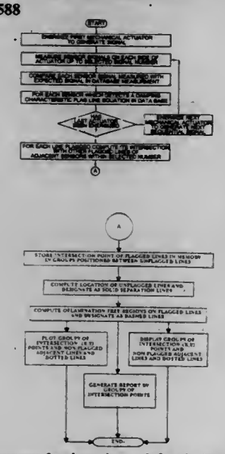
SYSTEM FOR IN-SITU DELAMINATION DETECTION IN COMPOSITES

Shu-Yau Wu, Artesia; Donald L. Edberg, Irvine, and Andrew S. Bicos, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Sep. 9, 1996, Ser. No. 709,932

Int. Cl.[6] G01N *29/00*

U.S. Cl. 73—588 **19 Claims**



1. A sensor system for detecting a defect in laminated composite

structures comprising:

at least one mechanical actuator, in operable contact with said laminated composite and adapted for generation of a vibration wave that propagates as a vibration signal along at least one propagation line extending through said laminated composite structure;

at least two delamination sensors, in operable contact with said composite structure, for sensing vibration signals generated by said actuator and propagating along propagation lines defined between said actuator and respective ones of said delamination sensors; and

delamination detection means in operable communication with said delamination sensors for evaluation of said sensed vibration signals that have propagated along propagation lines defined between the actuator and said delamination sensors, wherein said delamination detection means comprises:

means for analyzing the vibration signals propagating along the propagation lines and detected by said respective delamination sensors to determine whether the propagation lines extend through a delamination region in said laminated composite structure;

means for categorizing each of said propagation lines wherein said categorizing step categorizes propagation lines which extend through a delamination region as delamination lines and categorizes propagation lines which do not extend through delamination regions as delamination-free lines; and

means for determining the presence of a delamination region, the location of said delamination region, and boundaries of said delamination region based on the relative positions of said delamination lines and said delamination-free lines.

5,814,730

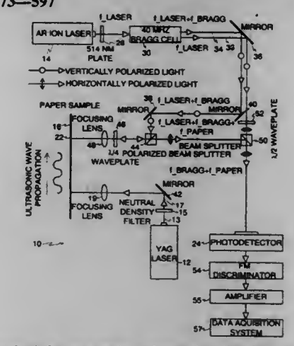
MATERIAL CHARACTERISTIC TESTING METHOD AND APPARATUS USING INTERFEROMETRY TO DETECT ULTRASONIC SIGNALS IN A WEB

Pierre H. Brodeur, Smyrna; Yves H. Berthelot, Decatur; Joseph P. Gerhardstein, Atlanta, and Mont A. Johnson, Snellville, all of Ga., assignors to Institute of Paper Science and Technology and Georgia Institute of Technology, Atlanta, Ga.

Filed Jun. 10, 1996, Ser. No. 662,463

Int. Cl.[6] G01N *29/08;29/24*

U.S. Cl. 73—597 **38 Claims**



1. A method for measuring ultrasonic vibrations in a moving paper web in a production line, comprising the steps of:

moving a paper web in a machine direction through a production line making the paper web;

inducing an ultrasonic vibration at a first location on the paper web;

providing a first laser beam having a reference frequency;

illuminating said paper web at a second location adjacent said first location with a second laser beam having a frequency differing from said reference frequency by a preselected frequency;

combining said first laser beam with a reflection from said second location of said second laser beam to provide a combined beam, said paper web reflecting the second laser beam to provide a reflected second laser beam, the second reflected laser beam having a frequency which is Doppler shifted from the first laser beam having the reference frequency by virtue of the paper web moving substantially perpendicular to the plane of the paper web along the path of the second beam;

detecting a beat frequency in said combined beam, the beat frequency being responsive to the Doppler shift in the second reflected laser beam; and

determining the Doppler shift from the beat frequency caused by the ultrasonic vibration to determine a characteristic of the paper web.

5,814,731

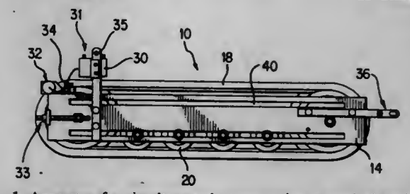
ULTRASONIC SCANNING APPARATUS FOR NONDESTRUCTIVE SITE CHARACTERIZATION OF STRUCTURES USING A PLANAR BASED ACOUSTIC TRANSMITTER AND RECEIVER IN A ROLLING POND

Alton Michel Alexander, 5550 Fisher Ferry Rd., Vicksburg, Miss. 39180; Richard Wayne Haskin, 1325 Wright Rd., Raymond, Miss. 39154, and Dan Edward Wilson, 2659 Jeff Davis Rd., Vicksburg, Miss. 39180

Filed Jan. 28, 1997, Ser. No. 789,888

Int. Cl.[6] G01N *29/28*

U.S. Cl. 73—644 **15 Claims**



1. Apparatus for simultaneously transporting acoustical testing mechanisms across the surface of a solid specimen while analyzing the condition of the interior of that specimen by acoustic waves traveling within the specimen and reflecting from surface boundaries within the specimen comprising:

an assembly within a frame for acoustically communicating with the specimen including at least a single pair of planar type acoustical communicating elements and an acoustic isolation device placed between the pair of elements that is in contact with the specimen surface,

a fluid sealing roller-traction means including a pair of outer belts and front and back rollers for rolling on the external surface of the specimen that is attached to the frame for allowing movement in a direction of the frame over the surface of the specimen with a relatively constant spacing therefrom,

a pulse encoder means for actuation of the acoustical communicating assembly that is mechanically coupled to the roller-traction means,

an acoustical-transmissive fluid maintained and sealed within a base portion of the fluid sealing roller-traction means between said belts and roller and a bottom portion of the at least a single pair of planar acoustical communicating elements and the specimen surface such that said fluid is carried across the specimen, and

means for attaching the assembly to the frame to suspend the assembly above the specimen surface as the frame is motivated over the specimen surface for establishing acoustical communication with the interior of the specimen, the attaching means including means for physical adjustment of each of the acoustical communicating elements.

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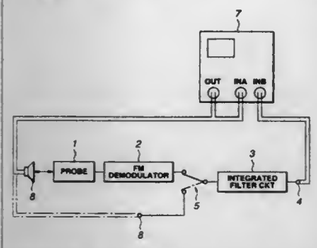
5,814,732

LASER DOPPLER SPEED MEASURING APPARATUS

Asahiko Nogami, Tokyo, Japan, assignor to Sony Magnescale Inc., Tokyo, Japan

Filed Sep. 5, 1996, Ser. No. 708,319
Claims priority, application Japan, Sep. 6, 1995, 7-229224
Int. Cl.[6] G01N *21/41*
U.S. Cl. 73—657 **9 Claims**



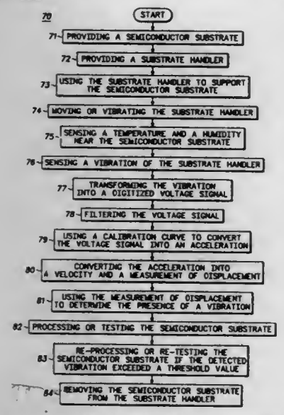
1. An apparatus for measuring a speed of an object, comprising:
a source of a laser beam, said laser beam having a reference beam and a beam incident on the object;
a photodetector arranged to detect a composite light of said reference beam and a beam reflected by the object and generate a signal indicative of said composite light detected;
an FM demodulator connected to said photodetector, said FM demodulator serving to FM-demodulate said signal;
filter circuit means for filtering said signal as FM-demodulated; and
a selector switch interposed between said FM demodulator and said filter circuit means, said selector switch ensuring switching between an output of said FM demodulator and a terminal for directly receiving an external signal.

5,814,733

METHOD OF CHARACTERIZING DYNAMICS OF A WORKPIECE HANDLING SYSTEM

Theodore A. Khoury; Greg A. Katrenick, and Richard O'Connell, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 12, 1996, Ser. No. 713,271
Int. Cl.[6] G01H *11/08;* **G01R** *31/01;31/02;31/26*
U.S. Cl. 73—658 **8 Claims**



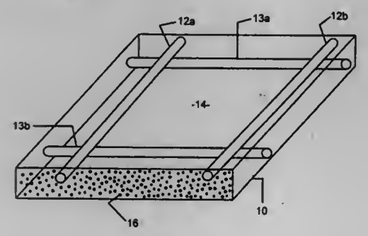
1. A method of fabricating a component comprising the steps of:
providing a substrate;
processing the substrate by probing the substrate;
determining a presence of a vibration near the substrate during the step of processing the substrate; and
re-processing the substrate when the vibration exceeds a threshold value.

5,814,734

MICROBALLON IMPREGNATED FIBER REINFORCED RTV FOLM COMPRESSION STRESS

Dick J. Chang, Los Angeles; James P. Nokes, and Francis Hai, both of Torrance, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Jun. 30, 1997, Ser. No. 884,782
Int. Cl.[6] G01N *3/08*
U.S. Cl. 73—819 **6 Claims**



RTV Film Cell

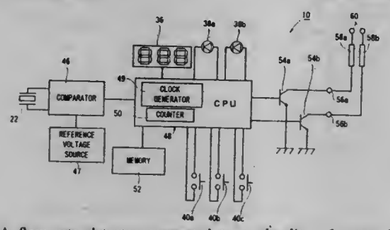
1. A sensor for measuring compression stress, the sensor comprising,
a film of deformable incompressible material,
microballoons impregnating the material, and
fibers reinforcing the material and disposed therein defining a plurality of cells within material, the fibers are for constraining the lateral deformation of the cells to induce compression stress in the film and pressure upon the microballoons to break the microballoons emitting acoustic emissions.

5,814,735

FLOW RATE DETECTOR

Shogo Kurisaki; Takashi Takebayashi; Ge Pinghou, and Tomonobu Endou, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1996, Ser. No. 716,522
Claims priority, application Japan, Sep. 25, 1995, 7-246518
Int. Cl.[6] G01F *1/32*
U.S. Cl. 73—861.22 **10 Claims**



1. A flow rate detector connected to a plurality of external devices comprising:
a flow passage for passage of a fluid therethrough:
a rod disposed in said flow passage;
a pressure sensor positioned downstream of said rod in said flow passage for measuring periodic fluctuations of Kármán vortexes shed in the fluid in said flow passage by said rod;
a reference voltage source for supplying a predetermined reference voltage;

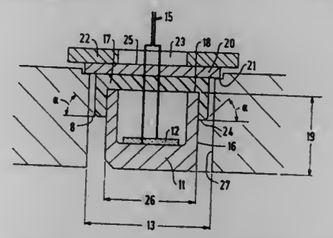
comparator means for outputting a binary signal 1 when an output voltage from said pressure sensor exceeds said reference voltage and a binary signal 0 when said output voltage is lower than said reference voltage, thereby outputting a binary pulse signal;
display means for displaying a flow rate;
reference setting means for establishing a plurality of different reference flow rates corresponding to each of said external devices;
signal output means for outputting an electric signal to said external devices; and
a processing circuit calculating said flow rate of the fluid from the periodic fluctuations measured by said pressure sensor and from period (T) of said pulse signal, displaying the calculated flow rate on said display means, comparing the calculated flow rate with the reference flow rates established by said reference setting means, converting the results of the comparisons into electric signals, and outputting the electric signals to said signal output means and to said respective external devices, thereby controlling said plurality of external devices based on the calculated flow rate in said flow passage.

5,814,736

HOLDER FOR ULTRASONIC TRANSDUCERS

Jürgen Löschberger, Fürth; Karl Spendel, Nürnberg; Thomas Siebenhaar, Redwitz, and Thomas Möckl, Coburg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 734,107, Oct. 21, 1996. This application Oct. 21, 1996, Ser. No. 734,107
Int. Cl.[6] G01F *1/66*
U.S. Cl. 73—861.25 **11 Claims**



1. In a holder for holding an ultrasonic transducer having an ultrasound projection direction and a cup-shaped housing with an outer wall surface, an outer cup bottom and a cup edge facing away from the ultrasound projection direction, the improvement comprising:
an elastomer molded body sheathing and holding the cup-shaped housing in direct contact, said elastomer molded body beginning at the cup edge and extending over from 25% to 60% of the outer surface of the cup-shaped housing, defining a remainder of the outer wall surface, the remainder of the outer surface and the outer cup bottom being free of said elastomer molded body.

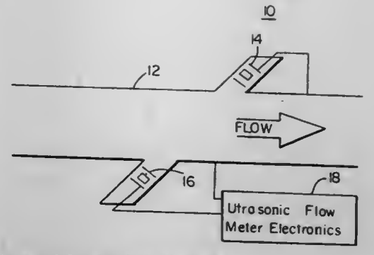
5,814,737

APPARATUS AND METHOD OF DETECTING AN ULTRASONIC SIGNAL

Alvin E. Brown, Santa Cruz, Calif., assignor to Dieterich Technology Holding Corp., Boulder, Colo.

Continuation-in-part of Ser. No. 720,863, Oct. 4, 1996, Pat. No. 5,639,971. This application Jan. 29, 1997, Ser. No. 790,657
Int. Cl.[6] G01F *1/66*
U.S. Cl. 73—861.28 **16 Claims**

13. A method of detecting an ultrasonic signal in an ultrasonic flow meter, comprising the steps:



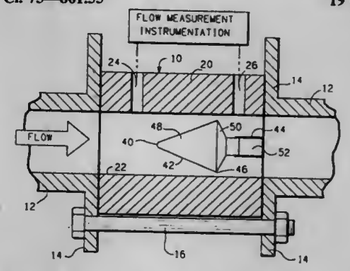
(a) transmitting the ultrasonic signal;
(b) receiving the ultrasonic signal;
(c) converting the ultrasonic signal to an electrical signal;
(d) comparing the electrical signal to a first level to form a phase one signal;
(e) comparing the electrical signal to a second level to form a phase two signal;
(f) arming a trigger circuit on a next rising edge of the phase two signal after the first falling edge of the phase one signal; and
(g) triggering a received signal when on an edge of the electrical signal after the trigger circuit is armed.

5,814,738

FLUID FLOW METER AND MIXER HAVING REMOVABLE AND REPLACABLE DISPLACEMENT MEMBER

Robert N. Pinkerton, Hemet, and Stephen A. Ifft, Redlands, both of Calif., assignors to McCrometer, Inc., Hemet, Calif.

Filed May 1, 1997, Ser. No. 848,887
Int. Cl.[6] G01F *1/22*
U.S. Cl. 73—861.55 **19 Claims**



14. A fluid flowmeter comprising, in combination,
a conduit for conveying fluid therethrough in a given direction, said conduit having a peripheral wall with an interior surface and having in relation to the direction of fluid flow an upstream direction and a downstream direction,
a fluid displacement member in said conduit including a first sloped wall portion facing in the upstream direction and tapering inwardly toward the axis of said conduit and a contiguous second sloped wall portion facing in the downstream direction and tapering inwardly toward the axis of said conduit, said sloped wall portions forming a periphery on said member and defining a peripheral edge at the juncture of their larger ends, the second sloped wall portion being of shorter axial extent and greater slope than the first sloped wall portion, said displacement member being mounted coaxially in said conduit with the plane of said peripheral edge substantially normal to the direction of fluid flow and with said sloped wall portions and peripheral edge spaced symmetrically inward from the interior surface of said conduit,
said displacement member deflecting the fluid to flow through a region between the periphery of the displacement member and the interior surface of the conduit and being effective to

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linearize fluid flow in said region and to flatten the velocity profile of fluid flow in areas within the conduit both upstream and downstream from the displacement member,

a first pressure tap extending through the wall of the conduit in the area upstream from said edge where the velocity profile of the fluid is relatively flat, and

a second pressure tap extending through the wall of the conduit in the area downstream from said edge where the velocity profile of the fluid is relatively flat,

said first and second pressure taps facilitating determination of the fluid pressure differential between the upstream and downstream sides of said edge for the purposes of measuring fluid flow through the conduit without requiring a pressure tap within said displacement member.

5,814,739

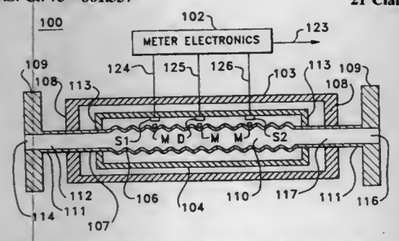
CORIOLIS FLOWMETER HAVING CORRUGATED FLOW TUBE

Craig Brainerd Van Cleve, Lyons, Colo., assignor to Micro Motion, Incorporated, Boulder, Colo.

Filed May 30, 1997, Ser. No. 865,853

Int. Cl.[6] G01F *1/84*

U.S. Cl. 73—861.357 **21 Claims**



1. A Coriolis flowmeter having flow tube means, drive means for vibrating said flow tube means, and sensor means coupled to said flow tube means for detecting Coriolis deflections of said flow tube means resulting from material flow through said vibrating flow tube means, said sensor means being responsive to said Coriolis deflections for generating output information regarding said material flow;

said Coriolis flowmeter further comprising:

said flow tube means having a static portion as well as having a dynamic portion vibrated by said drive means;

mounting means affixed to said static portion of said flow tube means for maintaining said static portion substantially non movable during vibrations of said dynamic portion of said flow tube means;

corrugations on said dynamic portion of said flow tube means for altering vibrational characteristics of at least one vibrational mode of said flow tube means;

said corrugations being at one or more flow tube segments having substantial bending moment in a vibrational mode shape for which said vibrational characteristics are altered;

said corrugations being simultaneously at flow tube segments of low bending moment in a vibrational mode shape for which said vibrational characteristics are not to be altered.

5,814,740

MULTI-AXIS FORCE PLATFORM

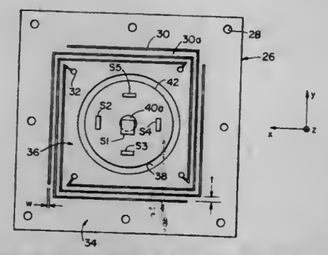
Nathan H. Cook, North Eastham, and Forest J. Carignan, Bedford, both of Mass., assignors to Advanced Mechanical Technology, Inc., Watertown, Mass.

Continuation of Ser. No. 65,556, May 20, 1993, Pat. No. 5,400,661. This application Mar. 24, 1995, Ser. No. 410,017

Int. Cl.[6] G01L *5/16*

U.S. Cl. 73—862.641 **10 Claims**

1. A multi-axis spring comprising:



a planar block comprising first and second regions of rigid material which are adjacent to each other, the first region circumscribed by a plurality of non-linearly shaped deflectable beams formed in the block, said beams surrounding the first region and elastically coupling the first region of the block to the second region of the block such that the first region of the block is deflectable relative to the second region along multiple axes while under load; and

a sensor for sensing loads on the block.

5,814,741

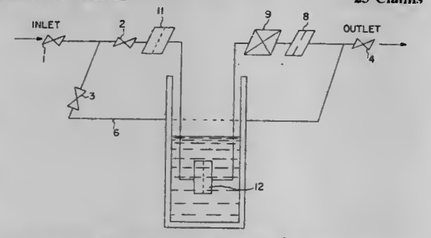
METAL SAMPLING METHOD AND SYSTEM FOR NON-HYDROLYZABLE GASES

Hwa-Chi Wang, Naperville, and Richard J. Udischas, Chicago, both of Ill., assignors to American Air Liquide Inc., Walnut Creek, Calif.

Continuation-in-part of Ser. No. 609,836, Mar. 1, 1996, Pat. No. 5,618,996. This application Sep. 9, 1996, Ser. No. 709,875

Int. Cl.[6] G01N *1/22*

U.S. Cl. 73—863.12 **23 Claims**



1. A system useful for sampling impurities, which system comprises:

a sample conduit connected to receive a flow of a gas, and a parallel conduit connected to said sample conduit at first and second locations, the second location being downstream of the first location;

first valve means downstream of the second location through which gas is exhausted from the sampling system;

first and second filter means in said sample conduit, which second filter means is operated at a temperature below ambient temperature;

second valve means upstream of the first and second filter means but downstream of the first location;

third valve means in said parallel conduit, for allowing gas to be conducted in parallel with respect to the first and second filter means of the system to allow back-filling of the gas through the first and second filters in the system until pressure on both sides of the second valve means is equalized.

5,814,742

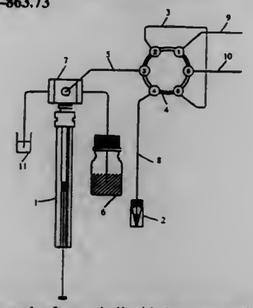
FULLY AUTOMATED MICRO-AUTOSAMPLER FOR MICRO, CAPILLARY AND NANO HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Johannes P. C. Vissers; Jean-Pierre Chervet, both of Amsterdam, Netherlands, and Pierre Salzmann, San Francisco, Calif., assignors to L C Packings, Nederland B.V., Amsterdam, Netherlands

Filed Oct. 11, 1996, Ser. No. 729,388

Int. Cl.[6] G01N *1/10;1/18*

U.S. Cl. 73—863.73 **12 Claims**



1. An autosampler for use in liquid chromatography comprising:

a) means for sample uptake by inserting a sharpened tip of a needle comprising a bore through a septum of a septum-covered sample container and into said container, translocating a sample intake tube comprising a terminus through said bore from a first position wherein said intake tube terminus is recessed within said needle to a second position wherein said terminus protrudes from said tip and into said sample, and aspirating a measured aliquot of less than about 5 μL of said sample into said intake tube to form an injection plug of said sample;

b) means for sample bracketing by bracketing said injection plug of said sample between first and second solvent plugs of a chromatographic mobile phase liquid;

c) means for reducing band dispersion by time-controlled switching of a multiport injection valve through which said injection plug is transferred, said injection plug being separated into more dispersed and less dispersed portions, whereby said less dispersed portion is directed to a chromatographic column and said more dispersed portion is diverted from said chromatographic column; wherein the time at which the injection valve is switched back to a load position and injection is terminated, the switching time S_t is calculated using the formula:

$$S_t = f \times V_{inj} \times 60/F$$

where f is a low-dispersion factor, V_{inj} is the desired sample injection volume in microliters, and F is the volumetric flow rate in microliters per minute.

5,814,743

DEVICE FOR TAKING SAMPLES OF NOXIOUS LIQUIDS, PARTICULARLY LIQUIDS CHARGED WITH SOLID PARTICLES

Daniel Kerlau, Chatenay Malbry; Thierry Prevost, Elancourt, and Patrice Roux, Paris, all of France, assignors to Compagnie Generale Des Matieres Nucleaires, Velizy Villacoublay, France

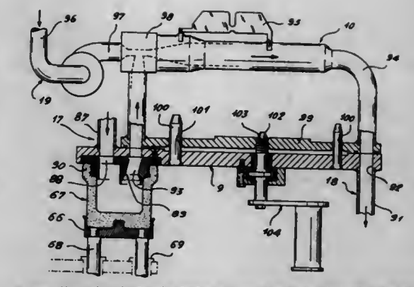
Filed Apr. 21, 1997, Ser. No. 840,566

Claims priority, application France, Apr. 22, 1996, 96 05011

Int. Cl.[6] G01N *1/14*

U.S. Cl. 73—863.83 **16 Claims**

1. A device for taking samples of noxious liquids charged with solid particles from a tank (25) and depositing said samples into a flask having a rim, said device comprising:



a sampling circuit that includes a vent, an aspiration pipe leading to the tank (25) and a return pipe, said aspiration pipe and said return pipe each having an end;

a unit (10) for circulating liquid through the sampling circuit; and

a support plate (9) under which the ends (88, 93) of the aspiration and return pipes are disposed, the rim (90) of the flask being applied under the support plate around said ends; and

wherein the aspiration and return pipes are without communication other than via the flask applied under the support plate, the liquid circulation unit (10) is situated in the return pipe and the aspiration pipe is connected to the vent (131, 132).

5,814,744

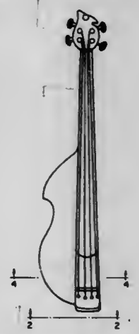
ENHANCEMENT OF ACOUSTIC MUSICAL INSTRUMENTS

Clare L. Hoke, Jr., 1318 N. Monte Vista Ave. Suite 11, Upland, Calif. 91786

Filed Jan. 5, 1996, Ser. No. 583,304

Int. Cl.[6] G10D *1/00;3/00*

U.S. Cl. 84—291 **6 Claims**



1. A stringed musical instrument having a neck and at least one or more vibrational plates, and at least one string stretched along said neck, and further including:

at least one side wall having at least one end and one side, wherein said at least one end is connected to at least one vibrational plate and said one side is connected to an additional part which extends between said neck and said side wall of the instrument, substantially non parallel to said neck, whereby musical vibrations produced by said at least one string, are transmitted accurately from said neck to said side wall and to said at least one or more vibrational plates of the instrument, wherein said at least one vibrational plate is connected to said side wall, but is not directly connected to said additional part.

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5,814,745

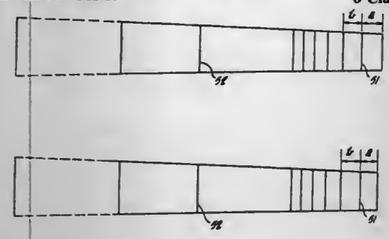
METHOD AND APPARATUS FOR FULLY ADJUSTING AND INTONATING STRINGED, FRETTED MUSICAL INSTRUMENTS, AND MAKING ADJUSTMENTS TO THE RULE OF 18

Howard B. Felten, 901 S. Hudson Ave., Los Angeles, Calif. 90019, and Gregory T. Back, 16000 Sunset Blvd., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 376,601, Jan. 23, 1995, Pat. No. 5,600,079, which is a continuation of Ser. No. 896,685, Jun. 10, 1992, Pat. No. 5,404,783. This application Aug. 15, 1996, Ser. No. 698,174

Int. Cl.[6] G10D *3/14*

U.S. Cl. 84—312 R — 8 Claims



1. A stringed musical instrument having the distance between the nut and the first fret being in the range of 1% to 10% shorter than the "rule of 18" standard.

5,814,746

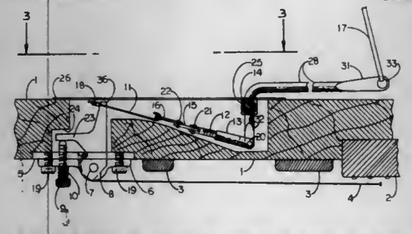
PITCH MODIFYING GUITAR BRIDGE ASSEMBLY

Bobby Joe Stafford, Locust Grove, Oklahoma, Okla. 74352

Filed Jul. 2, 1996, Ser. No. 699,706

Int. Cl.[6] G10D *3/04*

U.S. Cl. 84—313 — 3 Claims



1. A mechanism for varying the tension of strings of a musical instrument; the instrument having a front side and a rear side; said mechanism comprising:

a plate mounted on the front side;

a plurality of levers extending perpendicular to said plate from a first end positioned within a cavity of the instrument to a second end extending through and pivotally mounted on said plate; said strings respectively attached to the second ends of the levers; said cavity including a notch;

an arm extending perpendicularly from each of said levers above said notch;

a plurality of adjustable stops threadedly mounted to said plate and respectively engaging said arms such that said stops respectively limit pivoting of the levers in a first direction and said notch limits pivoting of the levers in an opposite second direction;

means for pivoting said levers connected to at least one of said first ends of said levers and extending through the rear side of the instrument.

5,814,747

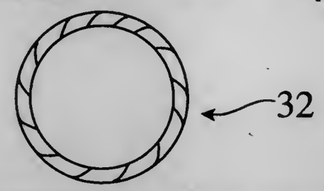
PERCUSSION INSTRUMENT CAPABLE OF PRODUCING A MUSICAL TONE

Craig Ramsell, 9 Edgewater Ct., San Rafael, Calif. 94903

Continuation of Ser. No. 328,046, Oct. 24, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 806,644

Int. Cl.[6] G10D *13/08*

U.S. Cl. 84—402 — 14 Claims



1. A method of producing a desired musical tone, comprising the steps of:

providing a tube made of a synthetic material tuned to the desired musical tone;

said tube having two open ends and surrounding an internal column of air;

said tube having a thickness sufficient to render said tube radially flexible;

striking said tube against a surface imparting mechanical energy to the column of air to vibrate to produce sound waves that result in said desired musical tone.

5,814,748

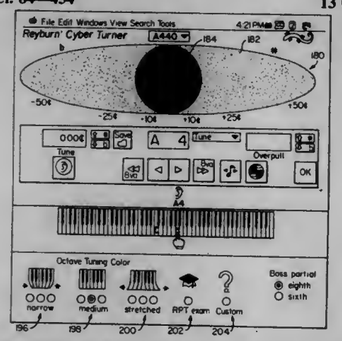
PITCH RAISE TUNING FOR DIGITAL AURAL MUSICAL INSTRUMENT TUNING

Dean Laurence Reyburn, Cedar Springs, Mich., assignor to Reyburn Piano Service, Inc., Cedar Springs, Mich.

Division of Ser. No. 663,653, Jun. 14, 1996, Pat. No. 5,719,343. This application Jun. 4, 1997, Ser. No. 868,791

Int. Cl.[6] G10G *7/02;7/00*

U.S. Cl. 84—454 — 13 Claims



1. A method for pitch raise tuning a musical instrument having a plurality of adjustable frequency tone generators for generating a like plurality of musical notes, said method comprising the steps of:

setting up a table of pitch raise overpull percentages for the musical notes of an instrument to be tuned in an electronic instrument tuning device;

operating said tuning device using said table of pitch raise overpull percentages to determine pitch raise tuning frequencies for musical notes of an instrument to be tuned; and

adjusting said plurality of adjustable frequency tone generators to conform their musical notes to said pitch raise tuning frequencies.

5,814,749

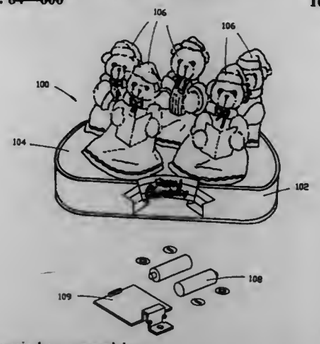
MOTION PRODUCING NECHANISM FOR MUSIC TOY

Aocheng Sui, and Xiangdong Chen, both of East Baihe Road, Wu Xing Bridge, Choyzhou Jiang Su, China

Filed Feb. 4, 1997, Ser. No. 794,928

Int. Cl.[6] G10F *01/06*

U.S. Cl. 84—600 — 16 Claims



1. A music box, comprising:

a housing including a motor, gear apparatus coupled with said motor and defining an output axis,

at least one platform means having a portion for supporting a figurine, said platform means being supported by said housing for pivoting motion about a horizontal axis, the horizontal axis and said output axis being arranged parallel to one another, and

linkage means coupling said gear apparatus and said at least one platform means, said linkage means including a first rigid element interconnecting said gear apparatus with a second rigid element, where said second rigid element is coupled with each said platform means, said linkage means being constrained for substantially linear, reciprocating, motion.

5,814,750

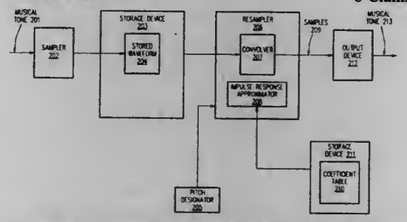
METHOD FOR VARYING THE PITCH OF A MUSICAL TONE PRODUCED THROUGH PLAYBACK OF A STORED WAVEFORM

Avery L. Wang, Redwood City, Calif., and Brooks S. Read, Grafton, Mass., assignors to Chromatic Research, Inc., Mountain View, Calif.

Filed Nov. 9, 1995, Ser. No. 555,537

Int. Cl.[6] G10H *1/12;7/08*

U.S. Cl. 84—602 — 8 Claims



1. A method for synthesizing an audio signal of a specified pitch p_f, sampled at a target sampling rate of 1/Tc, based on a sampled audio signal of a first pitch p_s, said sampled audio signal being sampled at a sampling rate of $1/T_s$, said method comprising the steps of:

approximating a selected finite duration impulse response function of a filter by a set of polynomial expressions, each polynomial expression approximating said selected impulse response function over a predetermined time period, each polynomial expression characterized by a set of coefficients;

selecting a time duration;

computing, for every T_c units of time during said time duration, a convolution sum of said sampled audio signal and said selected impulse response function, using said sampled audio signal and said set of polynomial expression; and

outputting to a digital-to-analog converter said computed convolution sums as digitized values of said synthesized audio signal sampled at said target sampling rate.

5,814,751

MUSICAL TONE GENERATING APPARATUS

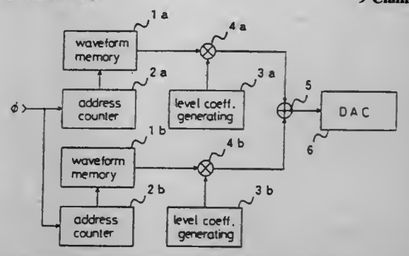
Miyuki Imamura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1995, Ser. No. 551,385

Claims priority, application Japan, Nov. 2, 1994, 6-269575; Nov. 2, 1994, 6-269576

Int. Cl.[6] G10H *7/00;7/02*

U.S. Cl. 84—604 — 9 Claims



1. A musical tone generating apparatus for generating a musical tone comprising:

a first waveform memory for storing first waveform data representing a first waveform portion of a stationary first waveform of said musical tone consisting essentially of one period existing at an elapse of a first predetermined time period following a beginning of said musical tone at which time initial transient harmonics associated with the beginning of the musical tone have substantially decayed;

a second waveform memory for storing second waveform data representing a second waveform portion of a second waveform of said musical tone consisting essentially of one period which is derived from differential spectral components representing differences between:

a fundamental wave component and harmonic components of a period of a non-stationary waveform existing at an elapse of a second predetermined time period, shorter than said first predetermined time period, occurring near the beginning of the musical tone about when said initial transient harmonics are at a maximum level: and

a fundamental wave component and harmonic components of the first waveform; and

synthesizing means for synthesizing output waveform data by repeatedly sequentially reading said first waveform data from said first waveform memory and said second waveform data from said second waveform memory while varying a level of each independently.

5,814,752

MUSICAL INSTRUMENT CROSSOVER CIRCUITS AND METHOD OF USING SAME

Paul E. Rivera, 10230 Fairgrove Ave., Tujunga, Calif. 91042

Filed Jan. 15, 1997, Ser. No. 782,304

Int. Cl.[6] G10H *1/46;* H03F *3/68;* H03G *5/00*

U.S. Cl. 84—711 — 21 Claims

18. A method of selectively amplifying musical instrument signals comprising the steps of:

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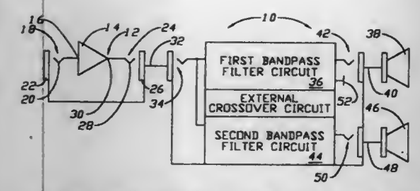


employing a base amplifier unit with an internal power amplifier for amplifying musical instrument signals of the full frequency range at a regular speaker output connector and for producing preamplified musical instrument signals of only a preselected frequency range at a special output connector;

connecting an external power amplifier to the special output connector for power amplifying the preamplified musical instrument signals of the only preselected frequency range; and

selectively blocking musical instrument signals within the preselected frequency range from being amplified by the internal power amplifier.

5,814,753

DEVICE FOR THE NONLETHAL COMBATING OF AIRCRAFT

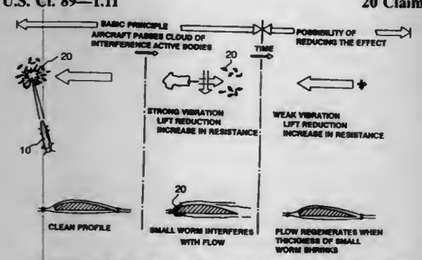
Ulrich Rieger, Feldkirchen, Germany, assignor to Daimler-Benz Aerospace AG, München, Germany

Filed Jun. 2, 1995, Ser. No. 459,696

Claims priority, application Germany, Jun. 6, 1994, 44 19 788.8

Int. Cl.[6] F42B *12/36;* **F41H** *13/00*

U.S. Cl. 89—1.11 **20 Claims**



1. A device for the nonlethal combating of aircraft, comprising:

nonlethal flight-mechanical restriction means including a plurality of small interference active bodies formed of elastic material for deforming upon the application of a force and regaining substantially completely its original dimensions upon removal of the force to substantially avoid damage to the aircraft upon undergoing a force of impact upon collision of the aircraft with the active bodies; and

transporting means for bringing said flight-mechanical restriction means into an active proximity of the aircraft and for scattering said interference active bodies at said active proximity of the aircraft, said interference active bodies including means for changing shape between a flat space-saving shape, achieved by applying force for positioning the interference active bodies in a packing configuration, and a spatially expanded shape in a release and suspension configuration, said transporting means deploying said interference active bodies to scatter said active bodies to form a cloud-like structure positioned in a proximity of a stagnation point of aerodynamic surfaces of the aircraft.

5,814,754

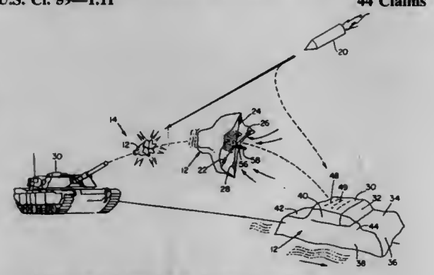
FALSE TARGET DEPLOYMENT SYSTEM

Arnis Mangolds, Stow, Mass., assignor to Foster-Miller, Inc., Waltham, Mass.

Filed Jan. 9, 1997, Ser. No. 781,010

Int. Cl.[6] B64D *1/04;* **H01Q** *15/00*

U.S. Cl. 89—1.11 **44 Claims**



1. A false target deployment system comprising:

an inflatable and collapsible decoy;

a munition for deploying said decoy in its collapsed state, from an actual target at risk due to a potential threat;

means for inflating the decoy after it is deployed; and

means, integral with said decoy, for emulating the shape, infrared signature, and radar signature characteristics of the actual target thereby providing a false target for the threat.

5,814,755

METHOD FOR DETERMINING THE DISAGGREGATION TIME, IN PARTICULAR OF A PROGRAMMABLE PROJECTILE

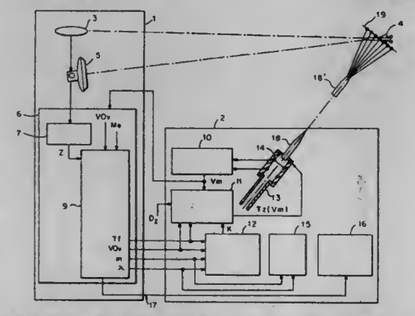
André Boss, Allenmoosstrasse 138, Zürich, Switzerland, CH-8050

Filed Nov. 14, 1996, Ser. No. 749,325

Claims priority, application Switzerland, Apr. 19, 1996, 1996 1000/96

Int. Cl.[6] F42C *13/00*

U.S. Cl. 89—6.5 **3 Claims**



1. A process for determining a fuze time for disaggregation of a programmable projectile (18) shot from a gun barrel (13) toward a target, the process comprising:

measuring a projectile measured muzzle velocity (Vm)

determining, from target sensor data, an impact distance (RT) from the gun barrel to the target;

subtracting a predetermined disaggregation distance (Dz) from the impact distance, the predetermined disaggregation distance being a difference between an impact point (Pf) and a disaggregation point (Pz) of the projectile;

calculating as a function of the measured muzzle velocity a corrected disaggregation time Tz(Vm) according to

$$Tz(Vm)=Tz+K*(Vm-VOv)$$

where Vov is a projectile average muzzle velocity, Tz is a nominal disaggregation time corresponding to the projectile average muzzle velocity, and K is a correction factor;

and wherein the correction factor K is given by

$$K=-\frac{1+(\partial TG/\partial r)|_{m_{r_0}}}{1+(p^2_G/v^2_G)\cdot\omega^2}\cdot\frac{|(\partial p_G/\partial v_0)|}{V_G} \qquad \text{(Eq. 17)}$$

5,814,756

METHOD AND DEVICE FOR DETERMINING THE DISAGGREGATION TIME OF A PROGRAMMABLE PROJECTILE

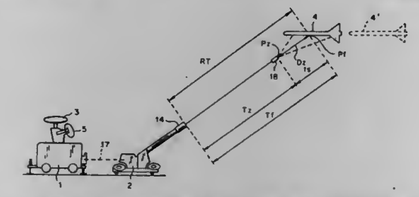
André Boss, Zürich, Switzerland, assignor to Oerlikon Contraves AG, Zürich, Switzerland

Filed Nov. 14, 1996, Ser. No. 749,328

Claims priority, application Switzerland, Apr. 19, 1996, 1996 0999/96

Int. Cl.[6] F42C *9/00*

U.S. Cl. 89—6.5 **15 Claims**



1. A process for determining the disaggregation time of a programmable projectile, wherein the calculation is at least based on an impact distance (RT) to a target determined from sensor data, a projectile velocity (Vm) measured at the muzzle of a gun barrel (13) and a predetermined disaggregation distance (Dz) between an impact point (Pf) and a disaggregation point (Pz) of the projectile (18),

characterized in that

the predetermined disaggregation distance (Dz) is maintained constant by a correction of the disaggregation time (Tz), wherein the correction is performed by means of the equation

$$Tz(Vm)=Tz+K*(Vm-VOv)$$

and wherein

TZ(Vm) means the corrected disaggregation time,

Tz the disaggregation time,

K a correction factor,

Vm the actually measured projectile velocity, and

VOv a lead velocity of the projectile.

5,814,757

MUZZLE BRAKE

Richard A. Buss, 1055 E. Washington, Cottage Grove, Oreg. 97424

Continuation-in-part of Ser. No. 680,143, Jul. 15, 1996, abandoned. This application Oct. 16, 1996, Ser. No. 732,160

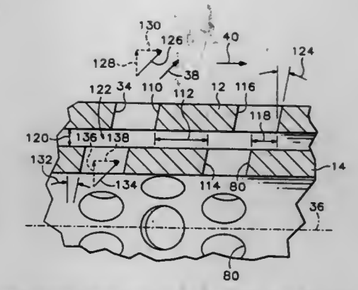
Int. Cl.[6] F41A *21/00*

U.S. Cl. 89—14.3 **33 Claims**

1. A firearm noise redirection system comprising:

a hollow inner sheath including forward, central and rear regions, the rear region adapted for attachment to a firearm and the central region including forwardly inclined apertures therein; and

a hollow outer sheath including forward, central and rear regions, the forward and rear regions, respectively, of the outer sheath being adapted for attachment to the forward and



rear regions of the inner sheath, and the central region of the outer sheath including forwardly inclined apertures therein and being spaced from the central region of the inner sheath so as to define a chamber therebetween such that sound waves or discharge gases entering the hollow inner sheath are redirected forwardly as the sound waves or discharge gases pass through the apertures in the inner sheath, through the chamber, and thereafter through the apertures in the outer sheath.

5,814,758

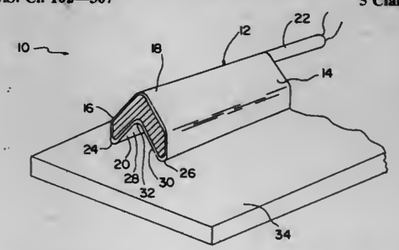
APPARATUS FOR DISCHARGING A HIGH SPEED JET TO PENETRATE A TARGET

David J. Leidel, Arlington, Tex., assignor to Halliburton Energy Services, Inc., Dallas, Tex.

Filed Feb. 19, 1997, Ser. No. 802,834

Int. Cl.[6] F42B *3/08;12/10*

U.S. Cl. 102—307 **5 Claims**



1. A flexible linear shaped charge for discharging a high speed jet to penetrate a target comprising:

an outer housing formed from a mixture of tungsten powder in a tin matrix; and

an explosive core disposed within said outer housing.

4. A flexible linear shaped charge for discharging a high speed jet to penetrate a target comprising:

an outer housing formed from a mixture of a low density metal matrix selected from the group consisting of tin and tin alloys mixed with a high density heavy metal powder selected from a group consisting of hafnium, tantalum and bismuth, wherein the amount of said high density heavy metal powder added to said low density metal matrix by weight is between about 35 and 75 percent; and

an explosive core disposed within said outer housing.

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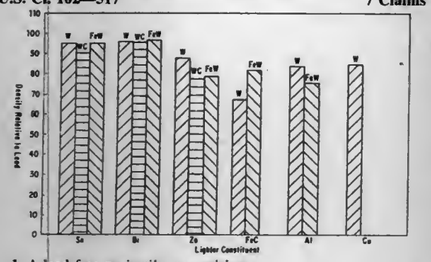
5,814,759
LEAD-FREE SHOT
Brian Mravic, North Haven; Deepak Mahulikar, Madison; Gerald Noel Violette, New Haven; Eugene Shapiro, Hamden, all of Conn., and Henry J. Halverson, Collinsville, Ill., assignors to Olin Corporation, New Haven, Conn.
Continuation of Ser. No. 311,980, Sep. 26, 1994, abandoned, which is a division of Ser. No. 125,946, Sep. 23, 1993, Pat. No. 5,399,187. This application Feb. 3, 1997, Ser. No. 794,286
Int. Cl.[6] F42B *12/74;* **C22C** *33/02;38/12*
U.S. Cl. 102—517 **7 Claims**

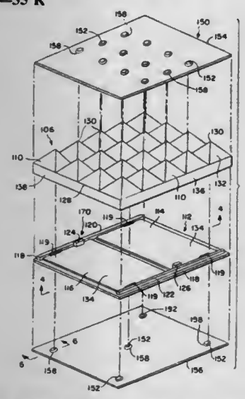


1. A lead-free projectile, comprising:
a compacted and sintered composite shot pellet that consists essentially of a high density first constituent that is ferrotungsten particles mixed with particles of a lower density second constituent that is iron.

5,814,760

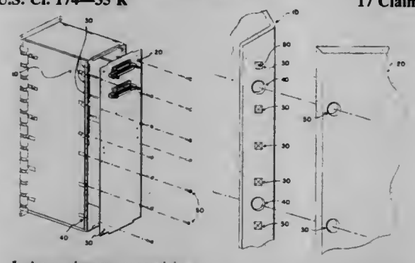
Patent Not Issued For This Number

5,814,761
PASSIVE EMI DISSIPATION APPARATUS AND METHOD
Benjamin J. Piazza, Venice, Calif., assignor to Shakti Audio Innovations, Pacific Palisades, Calif.
Filed Sep. 7, 1995, Ser. No. 525,941
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 R **12 Claims**



12. A passive apparatus for dissipating electromagnetic interference comprising:
a housing flexibly placed external to a host component;
a passive circuit located within said housing for passively absorbing and dissipating radiated electromagnetic interference over a broad range of frequencies, said passive circuit comprising a plurality of pyramid-shaped resonating chambers positioned over a common chamber, a plurality of quartz resonators each mounted upon a rubberized viso-elastic damping compound, and a plurality of permanent magnets each in physical communication with a magnetically permeable bar, said electromagnetic interference being dissipated as heat within said passive circuit.

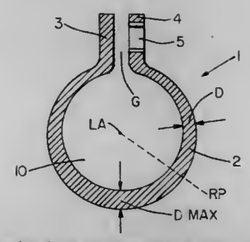
5,814,762
GROUNDING FOR ENCLOSURES
Ralph Michael Tusler, Monument; Mark S. Lewis, and Reuben Martinez, both of Colorado Springs, all of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 422,408, Apr. 12, 1995, abandoned. This application Jul. 25, 1996, Ser. No. 687,306
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 R **17 Claims**



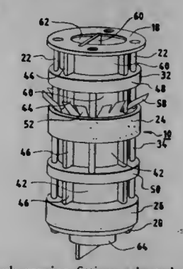
1. An enclosure, comprising:
a circuit board with a surface having a solid electrically conductive surface region at the surface;
an electrically conductive wall including an electrically conductive grounding element on a surface of the wall at an edge of the wall, the grounding element having sides, all such sides narrowing as the sides extend from the surface of the wall to terminate at a common vertex spaced from the surface of the wall; and
a mechanism joining the wall at the edge to the circuit board with the vertex of the grounding element pressing against the solid electrically conductive surface region at the surface of the circuit board to penetrate the solid electrically conductive surface region and establish an electrically conductive relationship with the electrically conductive surface region, the path of penetration of the vertex of the grounding element extending in a direction perpendicular to the solid electrically conductive surface region at the surface of the circuit board.

5,814,763
CLAMP FOR SECURING A FLEXIBLE PROTECTION HOSE TO AN ELECTRICAL CONNECTOR, ESPECIALLY IN AN AIRCRAFT
Safa Kirma, Holstein, Germany, assignor to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany
Filed Feb. 18, 1997, Ser. No. 802,888
Int. Cl.[6] H02G *3/26*
U.S. Cl. 174—40 CC **18 Claims**

1. A clamp for securing a flexible protection hose to an electrical connector, said hose having a given outer diameter, said clamp comprising a clamp wall forming a cuff having a longitudinal axis and longitudinal edges in said clamp wall, said longitudinal edges substantially facing each other to form a longitudinal gap, said clamp wall forming said cuff having an inherent biasing spring force component directed for biasing said longitudinal edges toward each other to form an inner cuff diameter tightly fitting onto said outer diameter in an installed condition of said cuff on said protection hose, and means for temporarily applying a gap widening force to said cuff to increase said inner cuff diameter against said biasing spring force component for inserting said protection hose into said cuff, whereby said biasing spring force component clamps said cuff onto said outer diameter of said protection hose when said gap widening force is released, wherein said clamp wall has a clamp wall thickness (D) that varies around said cuff from one of the longitudinal edges of said gap to the other of the longitudinal edges of said gap so that said clamp wall is thickest opposite said gap and thinnest next to said longitudinal edges of said gap and the thickest of said clamp wall thickness (D_{MAX}) is located where said gap widening force exerts a maximum bending moment.

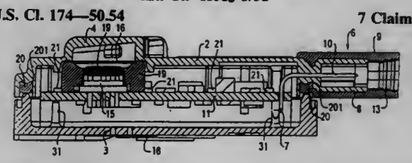


5,814,764
INSERT FOR POKE-THROUGH FITTING
John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Paterson, N.J.
Continuation of Ser. No. 410,830, Mar. 27, 1995, abandoned, which is a continuation of Ser. No. 962,001, Oct. 14, 1992, abandoned, which is a continuation of Ser. No. 593,758, Oct. 9, 1990, abandoned. This application Feb. 14, 1997, Ser. No. 800,356
Int. Cl.[6] H02G *3/28*
U.S. Cl. 174—48 **14 Claims**



1. A poke-through service fitting, adapted to be installed in a nominally two-inch diameter opening formed at a selected location in a fire-rated floor, for enabling source service cables, positioned below the floor, to pass through the fitting, for activation of devices adapted to be operable by connection to the fitting, and further adapted to retard the transmission of heat and flame from a fire from a floor below through the floor opening and fitting and to the floor, for enabling the fire rating of the floor to be substantially the same with or without the floor opening and fitting therein, and which fitting further provides a substantial volume for passing the source service cables therethrough, comprising
(a) a service head;
(b) an insert, for activation by source service cables, adapted to be positioned in the floor opening, including a raceway for passing the source service cables therethrough;
(c) means for retarding the transmission of heat and flame from a fire through the floor opening and the fitting to the floor, adapted to enable the fire rating of the floor to be substantially the same with or without the floor opening and fitting therein, and adapted to be positioned in the insert, comprising means for sealing the floor opening and service cables upon activation by heat and flame from a fire, adapted, in non-activated condition, to provide openings about the insert and the service cables upon inserting the insert in the floor opening, and to absorb heat, expand, and flow into the openings about the insert and about the service cables upon activation by heat and flame from a fire, and means for dissipating heat upon activation by heat and flame from a fire, positioned adjacent the sealing means, adapted to enable increased expansion of the sealing means upon activation by heat and flame from a fire;
(d) means for connecting the service head to the insert; and
(e) means for resisting pulling of the fitting out of the floor opening, adapted to be positioned in the insert, comprising a ring-shaped generally planar retainer, having an opening through which the source service cables are adapted to pass, including a plurality of tabs projecting from an outer periphery at a generally acute outer angle relative to an outer peripheral plane of the retainer, adapted to grip a wall of the floor opening upon insertion of the insert into the floor opening, and upon exertion of increased pulling force on the insert, to resist pulling of the fitting out of the floor opening, comprised of flexible resilient spring material, further comprising means for stabilizing the heat dissipating means, comprising a plurality of fins, extending generally parallel to a longitudinal axis of the insert, radiating in the longitudinal direction at spaced apart locations on an outer surface of the heat dissipating means, adapted to abut the sealing means.

5,814,765
WATERPROOF HOUSING WITH A PLUG-AND-SOCKET CONNECTION FOR PROTECTION ELECTRONIC CIRCUIT
Peter Bauer, Regensburg; Josef Dirmeyer, Bodenwöhr; Christian Plankl, Burgweinting, all of Germany, and Rony Van Houdenhove, Ruiselede, Belgium, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Jan. 28, 1997, Ser. No. 790,320
Int. Cl.[6] H01J *5/32*
U.S. Cl. 174—50.54 **7 Claims**



1. A waterproof housing with a plug-and-socket connection for protecting electronic circuits, comprising:
a hard plastic upper part;
a hard plastic lower part;
a soft plastic extruded seal disposed between said upper part and said lower part; and
a plug part having a hard plastic inner part constructed in one piece with one of said upper and lower parts, contact pins in said inner part, and a soft plastic sealing collar surrounding said inner part.

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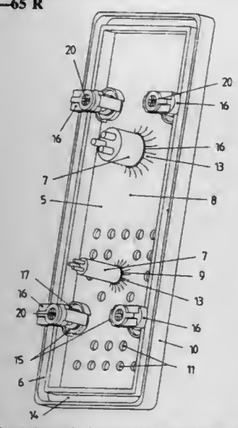
5,814,766
CABLE LEAD-THROUGH

Franz Striebel, Schulstrasse; Peter Koch, Ahornallee, and Hans Wickermann, Hindenburgstrasse, all of Germany, assignors to Striebel & John GmbH & Co. KG, Sasbach, Germany

PCT No. PCT/DE94/01241, § 371 Date May 31, 1995, § 102(e) Date May 31, 1995, PCT Pub. No. WO95/12234, PCT Pub. Date May 4, 1995
PCT Filed Oct. 20, 1994, Ser. No. 424,534
Claims priority, application Germany, Oct. 25, 1993, 93 16 279 U
Int. Cl.[6] H01B *17/00;* **H05K** *5/00*
U.S. Cl. 174—65 R **9 Claims**



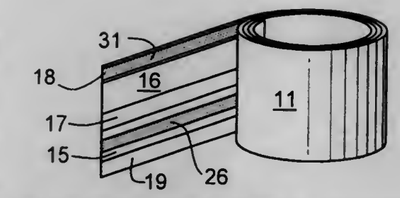
1. A cable lead-through for sealably receiving a cable inserted therethrough, comprising:
a frame; and
a lead-through panel mounted in said frame, said panel being in the form of a flange provided with a flange locking device having vertically adjustable clamping lugs, said panel being produced from an elastomerically crosslinked, thermoplastic material which is highly stretchable, highly flexible, and highly tear-resistant, said panel being formed with one or more break areas which are smaller in diameter than a cross-sectional diameter of cable to be received,
a bead-shaped seal running continuously along the flange, said seal being produced from the same elastomerically crosslinked material and being connected to the lead-through panel, whereby
when a cable is inserted through said panel in a region of said break area, the cable passes through the panel distorting the material around the break area, said distorted material around said cable bearing permanently and with high elastic stress against an outer surface of said cable thereby sealing said cable elastically without a need for further sealing.

5,814,767
FLEXIBLE PLASTIC DUCTING AND METHOD FOR MAKING AND FORMING SAME

Neal Katz, Wheeling, Ill., assignor to Richco Inc., Chicago, Ill.

Filed Apr. 9, 1997, Ser. No. 838,652
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—68.1 **14 Claims**

1. A length of insulating material cut off a coiled strip, said length forming a channel-like duct open at both ends for containing wire-like members extending along said length, said length comprising:
series of spaced apart parallel score lines longitudinally arranged along said length,

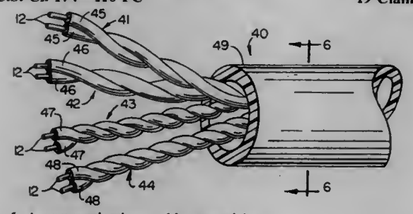


said score lines defining top, bottom and side walls of said duct, said length being foldable along said score lines to form said duct when folded, and
a longitudinally extending adhesive strip arranged along said length and securing said walls formed into said duct when connected between at least two of said walls.

5,814,768
TWISTED PAIRS COMMUNICATIONS CABLE

Rob Wessels, Hickory, N.C., and Trent Hayes, Suwanee, Ga., assignors to Commscope, Inc., Catawba, N.C.

Filed Dec. 11, 1996, Ser. No. 761,981
Int. Cl.[6] H01B *11/02*
U.S. Cl. 174—110 FC **19 Claims**



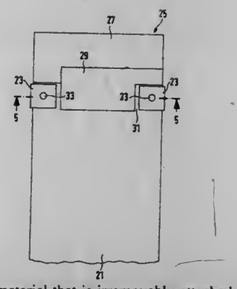
1. A communications cable comprising
a cable jacket;
a first pair of twisted wires disposed within said jacket, each wire thereof having a conductor surrounded by a first insulating material; and
a second twisted pair of wires disposed within said jacket and having a twist lay length different from that of said first twisted pair, each wire of said second twisted pair having a conductor surrounded by an insulating material;
the insulating material of said first twisted pair differing in a physical property from the insulating material of said second twisted pair, the physical property of the insulating material of said second pair being correlated with said physical property of the insulating material of said first twisted pair and with the difference in twist lay length of said first and second twisted pairs so that the phase delay of said first and second twisted pairs is matched.

5,814,769
RIBBON CABLE WITH SHIELDED CONNECTION

Anders Karlström, Erlenstrasse 1, 91341 Röttenbach; Andrea Wagner, Mindelheimer Str. 72, 90455 Nürnberg, and Thomas Meschwitz, Jochensteinstr. 39, 90480 Nürnberg, all of Germany

Filed Nov. 26, 1996, Ser. No. 756,714
Claims priority, application Germany, Nov. 28, 1995, 195 44 357.8
Int. Cl.[6] H01B *7/08*
U.S. Cl. 174—117 F **21 Claims**

1. Ribbon cable comprising a plurality of electrical cable conductors embedded next to each other in an insulation material, an electrical cable shield on one of two flat sides of the insulation material, and at least one contact element consisting of an electri-

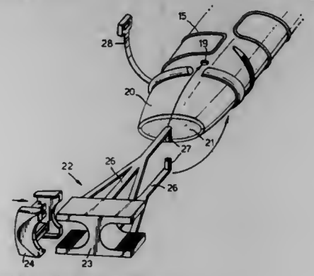


cally conducting material that is irremovably attached in electrical contact with said electrical cable shield, said at least one contact element being adapted for electrical contacting by means of a contact spring of a plug-in connector that accepts the ribbon cable and a contact surface of an electromagnetic interference (EMI) housing that accepts the ribbon cable.

5,814,770
CABLE CLOSURE

Amandus Lucien Emiel Pieck, Kortenaken; Etienne Laeremans, Scherpenheuvel, and Marc Demesmaeker, Antwerpen, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

PCT No. PCT/GB94/02443, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO95/13642, PCT Pub. Date May 28, 1995
PCT Filed Nov. 8, 1994, Ser. No. 635,947
Claims priority, application United Kingdom, Nov. 8, 1993, 9322929
Int. Cl.[6] H02G *11/00*
U.S. Cl. 174—135 **24 Claims**

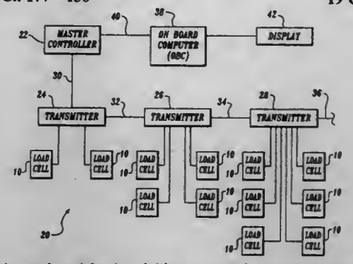


1. A cable enclosure comprising:
(a) a housing having an inlet for cables;
(b) a strain-relief device that can be connected to the cables and to the housing in strain-relieving fashion, the strain-relief device comprising:
(i) a first part that can be attached to the cables adjacent the housing; and
(ii) an arm attached to the first part and movable with respect to it to bring a distal end thereof into contact with the housing, the distal end having means for engaging the housing and thus connecting the strain-relief device to the housing after the first part has been secured to the cables and after the housing has been sealed around the cables, the means comprising a peg that can be inserted into a hole in the housing; and
wherein the first part comprises three sub-parts that can be assembled around two cables with one of said sub-parts between said two cables and the other two of said sub-parts at each side of said two cables.

5,814,771
ON-BOARD MICROPROCESSOR CONTROLLED LOAD WEIGHING SYSTEM

Bryan R. Oakes, Redmond; Peter B. Mortensen; Peter N. Nguyen, both of Renton, and Rick A. Beets, Issaquah, all of Wash., assignors to Structural Instrumentation, Inc., Tukwila, Wash.

Filed Feb. 16, 1996, Ser. No. 602,710
Int. Cl.[6] G01G *19/08*
U.S. Cl. 177—136 **19 Claims**



1. An on-board load weighing system for measuring the load placed on the load platform of a tractor-trailer truck, the system comprising:
at least one load sensor coupled to the trailer and load platform and at least one load sensor coupled to the tractor, each load sensor being used to produce a strain signal that is a function of a load placed on the load platform;
at least one transmitter located on the trailer and electrically connected to said load sensor coupled to the trailer and at least one transmitter located on the tractor and electrically connected to said load sensor coupled to the tractor, each transmitter including a microprocessor, a memory, and a data interface, each of the load sensors providing the transmitter to which said load sensor is connected said strain signal, each transmitter processing said strain signal in combination with calibration data stored within the transmitter memory to produce a load signal indicative of the load placed on the load sensors attached to the respective transmitter, the transmitters located on the tractor and trailer being serially connected to one another to form a chain-like sequence of transmitters; and
a master controller located on the truck and electrically connected to the transmitter at a first end of the serially connected transmitters to form a network, the master controller receiving said load signals from the transmitters and producing a display signal that is an indication of the load placed on the load platform.

5,814,772
WEIGHING APPARATUS WITH WEIGHT DETECTING CONVEYOR

Ryoji Nishimura; Yukio Wakasa, and Ryoichi Sato, all of Shiga, Japan, assignors to Ishida Co., Ltd., Kyoto, Japan

Filed Jan. 3, 1996, Ser. No. 582,511
Claims priority, application Japan, Jan. 11, 1995, 7-019748
Int. Cl.[6] G01G *19/00*
U.S. Cl. 177—145 **18 Claims**

1. A weighing apparatus comprising:
a weighing conveyor with a conveyor belt driven by a drive motor for transporting and weighing an object at the same time and outputting a weight signal indicative of the weight of said object;
a data input means for inputting a first length value representing the length of said weighing conveyor in the direction of transportation of said weighing conveyor and a second length value representing the length of said object in the direction of transportation of said weighing conveyor;

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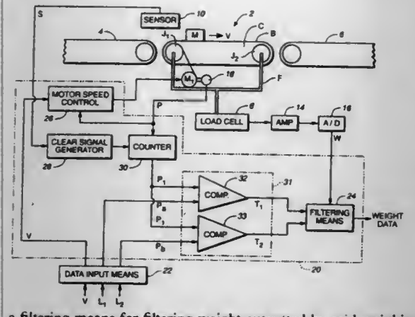


a filtering means for filtering weight outputted by said weighing conveyor as representing the weight of said object;

a distance detecting means for detecting the distance traveled by said object on said weighing conveyor from the angle of rotation of said drive motor; and

a timing setting means for setting a timing program for processing said weight signals directly on the basis of the position of said object on said weighing conveyor as determined in real time by said distance detected by said distance detecting means, said first length value and said second length value.

5,814,773

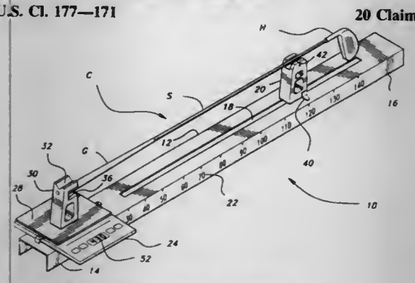
GOLF CLUB SURVEY INSTRUMENT WITH VARIABLE FULCRUM

Mondher Latiri, 7F 95-5 Shin-Gia Road, Feng-Shan, Kaohsiung, Taiwan

Continuation-in-part of Ser. No. 659,925, Jun. 7, 1996. This application Dec. 16, 1996, Ser. No. 767,366

Int. Cl.[6] A63B *53/00*

U.S. Cl. 177—171 **20 Claims**



1. A golf club survey instrument, comprising:

a flat, elongate base component having a first end and an opposite second end, with said first end including weight measurement means immovably affixed thereatop;

said weight measurement means including a golf club support affixed thereatop, and;

said base component further including adjustable fulcrum track means disposed therealong and an adjustably positionable fulcrum installed along said track means.

5,814,774

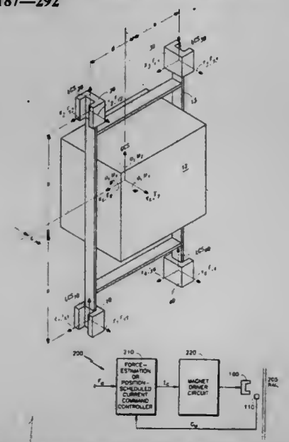
ELEVATOR SYSTEM HAVING A FORCE-ESTIMATION OR POSITION-SCHEDULED CURRENT COMMAND CONTROLLER

Timothy M. Remmers, Winsted; Randall K. Roberts, Amston; Rajesh Rajamani, East Hartford, and Roy S. Colby, Tariffville, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 29, 1996, Ser. No. 626,749

Int. Cl.[6] P66B *1/34;* **B66B** *7/04*

U.S. Cl. 187—292 **13 Claims**



1. An elevator system for controlling horizontal movement of an elevator car with respect to guide rails in an elevator hoistway with electromagnets of the elevator car, comprising:

a force-estimation or position-scheduled current command controller, responsive to a desired force command signal containing sensed position feedback control information sensed without sensing magnetic flux between pole faces of the electromagnets and the guide rails and containing sensed acceleration feedback control information, said force-estimation or position-scheduled current command controller further responsive to a sensed gap signal containing information about actual gaps between electromagnets of the elevator car and the guide rails, for providing a force-estimation or position-scheduled current command controller signal; and

a magnet driver circuit, responsive to the force-estimation or position-scheduled current command controller signal, for providing a magnet driver circuit signal to control the horizontal movement of the elevator car with respect to the guide rails in the elevator hoistway.

5,814,775

ROTARY SWITCH WITH NON-DEFORMABLE CONNECTING END PORTIONS

Tien-Ming Chou, Taichung, Taiwan, assignor to Excel Cell Electronic Co., Ltd., Taichung City, Taiwan

Filed Sep. 6, 1996, Ser. No. 708,932

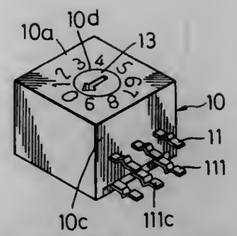
Int. Cl.[6] H01H *19/60;9/00*

U.S. Cl. 200—11 R **4 Claims**

1. A rotary switch comprising:

an insulative first housing having a top wall with an axial hole formed therein, a bottom wall with a socket-like cavity formed therein, an upright side wall lateral to said top wall, and a shaft journalled in said axial hole to rotate stepwise relative to said top wall;

a plurality of first terminals disposed in a first array, and having first contact end portions embedded in said first housing, and first connecting end portions extending traversely from said



axial hole and outwardly of said upright side wall, said first connecting end portions having a first length sufficient for electrical connection;

a plurality of second terminals disposed in a second array, and having second contact end portions embedded in said first housing, and second connecting end portions extending axially from said axial hole and outwardly of said bottom wall at a distal end thereof relative to said upright side wall, each of said second connecting end portions having a second length longer than said first length so as to form a protracted intermediate segment and a connecting end segment for electrical connection, wherein stepwise rotation of said shaft relative to said top wall of said first housing actuates a switching action among said first and second contact end portions; and

an insulative second housing molded around portions of said protracted intermediate segments, said second housing having a plug-like body such that, when said second connecting end portions are bent over said bottom wall to extend said connecting end segments parallel to said first connecting end portions and beyond said upright side wall for electrical connection, said plug-like body will be press-fitted in said socket-like cavity.

5,814,776

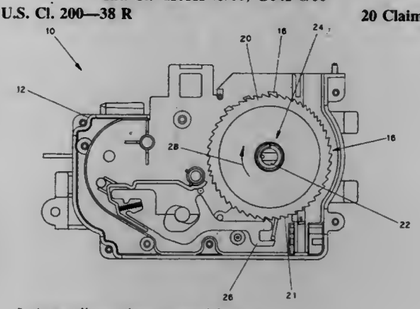
APPLIANCE TIMER HAVING COUPLING MECHANISM THAT PREVENTS CAMSTACK FROM ROTATING IN INAPPROPRIATE DIRECTION

Lloyd C. Worley, Hendricks County, Ind., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 27, 1997, Ser. No. 807,350

Int. Cl.[6] H01H *43/00;* **G04F** *8/00*

U.S. Cl. 200—38 R **20 Claims**



1. An appliance timer, comprising:

a camstack having a program blade attached thereto;

a knob shaft; and

a coupling mechanism which connects said knob shaft to said camstack, wherein said coupling mechanism provides for continuous bi-directional rotation of said knob shaft, said coupling mechanism including (1) a first coupler having a structure with a notch defined therein, and (2) a second coupler having a body and a tab which is movable in relation to said body, said tab being positionable within said notch.

5,814,777

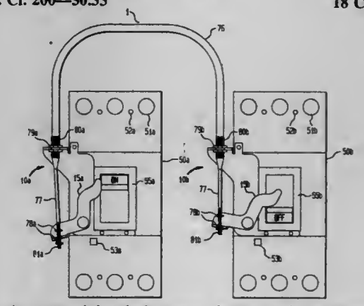
CABLE INTERLOCK SYSTEM FOR CIRCUIT BREAKERS

Russell B. Green, Douglasville, and Bernard DiMarco, Lilburn, both of Ga., assignors to Siemens Energy & Automation,Inc., Alpharetta, Ga.

Filed Mar. 29, 1996, Ser. No. 625,465

Int. Cl.[6] H01H *9/26*

U.S. Cl. 200—50.33 **18 Claims**



1. An external interlock system for preventing at least two circuit breakers from being closed at the same time, comprising:

a first mounting bracket adapted to be associated with a first circuit breaker;

a first lever arm adapted to be movably associated with said first mounting bracket;

a second mounting bracket adapted to be associated with a second mounting bracket;

a second lever arm adapted to be movably associated with said second mounting bracket; and

a single cable assembly having one end adapted to be connected to said first lever arm and having another end adapted to be connected to said second lever arm,

wherein said single cable assembly, said first lever arm and said second lever arm are adapted to operate together so as to prevent the second circuit breaker from being moved from an open position to a closed position when the first circuit breaker is in one of the closed position and a tripped position.

5,814,778

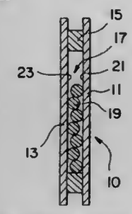
MULTIPLE SPHERE MOTION DETECTOR

Jerry Schell, Chanute, Kans., assignor to Schell Electronics, Inc., Chanute, Kans.

Filed Feb. 6, 1997, Ser. No. 796,579

Int. Cl.[6] H01H *35/14*

U.S. Cl. 200—61.45 R **7 Claims**



1. An omni-directional motion detector comprising:

a) a housing having parallel top and bottom flat walls spaced apart a spacing distance by an insulative spacer wall, said walls defining a chamber;

b) a multiplicity of identical spheres having electrically conductive surfaces disposed within said chamber and freely movable therein, said spheres having diameters slightly smaller than said spacing distance;

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c) each of said top wall and bottom wall having an internal surface with a generally elliptical pattern of electrical contacts thereon, each said pattern consisting of a first continuous circuit portion and a second continuous circuit portion, each of said circuit portions including a plurality of arcuate contact portions, with said arcuate contact portions of said first circuit portion alternating adjacently with arcuate contact portions of said second contact portion;

d) whereby, when said spheres roll on said internal surfaces, electrical interconnections between said first and second circuit portions of said respective internal surfaces via said spheres occur which may be detected to detect motion of said housing.

5,814,779

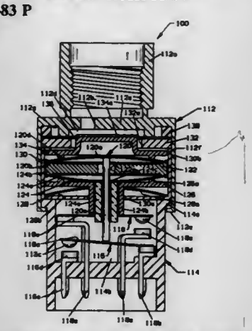
FLUID PRESSURE RESPONSIVE ELECTRIC SWITCH

George Verras, Mansfield, Mass., and Daniel Morin, North Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1996, Ser. No. 724,202

Int. Cl.[6] H01H *35/34*

U.S. Cl. 200—83 P **7 Claims**



1. A pressure responsive electric switch for controlling separate first and second electrical circuits in response to selected pressure levels comprising:

a housing having an upper end portion and a lower end portion, first and second sets of electrical contacts mounted in the lower end portion of the housing, each set having a stationary and a movable contact member, each movable contact member movable into and out of engagement with the respective stationary contact member, the second movable contact member having an aperture therethrough,

a fluid receiving port formed in the upper end portion of the housing,

a movable mounted pressure to force converter having a pressure receiving surface on one side of the converter and a force transfer surface on an opposite side of the converter,

a flexible diaphragm disposed between the port and the pressure receiving surface of the converter,

a support ring having an outer peripheral portion with first, upper and second, lower, disc seats formed on opposite sides thereof, the ring having a centrally located opening therethrough,

a first snap acting disc movable between oppositely dished configurations received on the first, upper, disc seat of the ring and being in engagement with the force transfer surface of the converter,

a second snap acting disc movable between oppositely dished configurations received on the second, lower, disc seat of the ring, the second snap acting disc having a centrally disposed aperture therethrough,

a support member mounted in the housing having a centrally disposed opening with a motion transfer pin sleeve extending therefrom, a reaction surface formed on the support member in engagement with the second snap acting disc, and

first and second motion transfer pins, the second motion transfer pin having a bore therethrough and slidably received in the motion transfer pin sleeve of the support member and extending between the second snap acting disc and the second movable contact member, and the first motion transfer pin extending from the first snap acting disc through the opening of the ring and the apertures of the second snap acting disc and the second movable contact member to the first movable contact member.

5,814,780

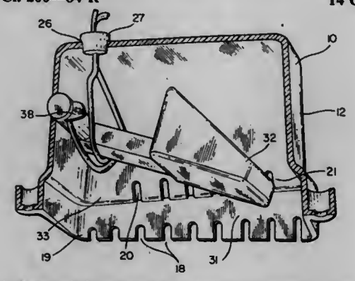
PIVOTABLE FLOAT SWITCH WITHIN A HOUSING

Scott K. Batchelder, Newburyport; James T. Burrill, Gloucester, and Gary M. Sable, Newton Centre, all of Mass., assignors to Rule Industries, Inc., Gloucester, Mass.

Filed Sep. 25, 1996, Ser. No. 720,145

Int. Cl.[6] H01H *35/18*

U.S. Cl. 200—84 R **14 Claims**



1. A float switch operated by rotating a member to open and close an electrical circuit, said float switch comprising:

a housing having a pair of opposing pivot arm apertures;

a float body positioned within and pivotably attached to said housing, said float body pivoting about a pivot axis, said float body including a neck and a pair of pivot arms, each said arm extending from said neck out of each said pivot arm aperture, said pivot arms being hollow; and

a pair of wires for carrying an electrical current in the electrical circuit, said wires being supported within said pivot arms, wherein each said wire exits from a respective pivot arm through a wire aperture, loops around said neck, and exits said housing at a position above said pivot axis.

5,814,781

PUFFER TYPE GAS CIRCUIT BREAKER

Osamu Koyanagi, Hitachi; Kastuichi Kashimura, Takahagi; Yoshihito Asai, Hitachi; Yukio Kurosawa, Hitachi; Goro Daimon, Hitachi; Kenji Tsuchiya, Hitachi; Eisaku Mizufune, Hitachi, and Kogi Ishikawa, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

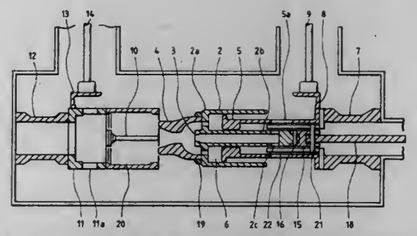
Filed Jan. 31, 1996, Ser. No. 594,491

Claims priority, application Japan, Feb. 3, 1995, 7-016658

Int. Cl.[6] H01H *33/88*

U.S. Cl. 218—60 **4 Claims**

1. A puffer type gas circuit breaker comprising a movable arc contact provided within an envelope, filled with an arc-extinctive gas, a fixed arc contact opposing said movable arc contact, a puffer cylinder having a cylinder section and a shaft section, and a dielectric nozzle fixed to said puffer cylinder together with said movable arc contact for guiding the arc-extinctive gas to spray the gas between the arc contacts being opened and spaced apart from each other, wherein said movable arc contact and said fixed arc contact are disconnectable by operation of the shaft section of said



puffer cylinder by way of an operating rod, wherein a guide section for performing radial guidance is provided at a coupling section disposed between said operating rod and said shaft section, and

wherein said coupling section is coupled by a guide pin which is guided by said guide section, said coupling section being guided by said guide section in an axial direction of said guide pin.

5,814,782

ROWER CIRCUIT-BREAKER HAVING A CLOSING RESISTOR

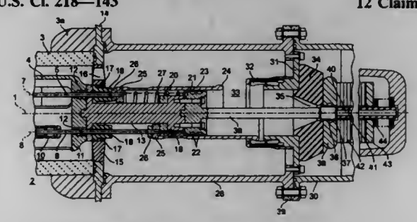
Roger Müller, Sins, and Jiri Talir, Buchs, both of Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Nov. 18, 1996, Ser. No. 746,936

Claims priority, application Germany, Dec. 16, 1995, 195 47 098.2

Int. Cl.[6] H01H *33/16;9/42*

U.S. Cl. 218—143 **12 Claims**



1. A power circuit breaker, comprising;

at least one arcing chamber extending along a central axis having at least one power interruption point with at least one contact which is moved by a driving mechanism, said at least one arcing chamber having at least one closing resistor which is connected in series with the at least one power interruption point, and said at least one arcing chamber having a resistive contact which is connected in parallel with the at least one closing resistor and which closes after the at least one power interruption point during the connection operation and opens after the at least one power interruption point during the disconnection operation, wherein

the resistive contact is mechanically connected to the at least one moving contact, rectilinearly along at least one axis and

a coupling element is interposed in the rectilinear mechanical connection, and

the coupling element is operable to effect a time delay both during the connection operation and the disconnection operation.

5,814,783

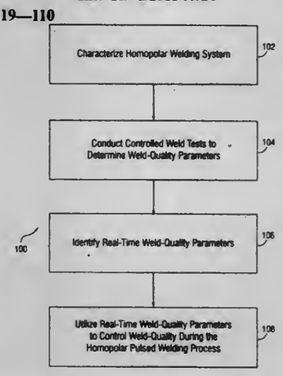
METHOD AND APPARATUS FOR REAL-TIME WELD-QUALITY CONTROL AND POST-PROCESS WELD-QUALITY VERIFICATION FOR HOMOPOLAR PULSED WELDING

Michael W. Harville, and William F. Weldon, both of Austin, Tex., assignors to Board Of Regents, University Of Texas Systems, Austin, Tex.

Continuation-in-part of Ser. No. 393,988, Feb. 24, 1995, abandoned. This application Feb. 23, 1996, Ser. No. 613,821

Int. Cl.[6] B23K *11/26*

U.S. Cl. 219—110 **13 Claims**



1. A method for real-time weld-quality control in a weld-quality control system for homopolar-pulsed welding, comprising:

characterizing a homopolar welding system;

conducting controlled weld tests to determine at least one in-process parameter that correlates to a satisfactory weld-quality of a weld;

identifying at least one of said at least one in-process parameter that may be used as a real-time weld-quality control parameter; and

utilizing said at least one real-time weld-quality control parameter as an in-process measured parameter to control the weld-quality during a homopolar pulsed welding process.

5,814,784

LASER-WELDING TECHNIQUES USING PRE-HEATED TOOL AND ENLARGED BEAM

Kenneth Grant Kinsman, and Walter W. Duley, both of Waterloo, Canada, assignors to Powerlasers Ltd., Waterloo, Canada

Continuation-in-part of Ser. No. 4,127, Jan. 13, 1993. This application Jan. 31, 1995, Ser. No. 381,200

Claims priority, application United Kingdom, Jan. 13, 1992, 9200622; Feb. 2, 1994, 9401998

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.6 **21 Claims**

1. A method of transferring energy from a laser beam to workpiece for laser processing comprising the steps of irradiating a tool with a laser beam to elevate the temperature thereof positioning said tool adjacent to said workpiece to transfer energy thereto and transferring said beam from said tool to said workpiece after initial

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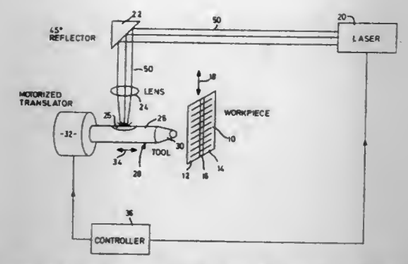


transfer of energy from the tool to heat the workpiece and upon attainment of a predetermined physical condition of said workpiece.

5,814,785

Patent Not Issued For This Number

5,814,786

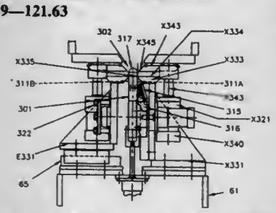
SYSTEM AND METHOD FOR LASER BUTT-WELDING

Kenneth C. Johnson, Bloomingdale, and Christopher A. Zurek, Crystal Lake, both of Ill., assignors to Littell International, Inc., Addison, Ill.

Filed Nov. 8, 1995, Ser. No. 554,372

Int. Cl.[6] B23K *26/02*

U.S. Cl. 219—121.63 **26 Claims**



1. A system for welding a first sheet metal component having a joint edge to a second sheet metal component having a joint edge, wherein a weld joint is formed between the components at said edges by a laser beam, comprising:

a) a welding sub-system including a welding head mounted for travel on a support structure while focusing a laser beam at a weld line;

b) a gauging sub-system connected to said support structure, said gauging sub-system including first and second pairs of gauging elements movable between a retracted position and a gauging position;

c) said first pair of gauging elements extending vertically between said joint edges in their gauging position and defining a first joint edge contact line and said second pair of gauging elements extending vertically between said joint edges in their gauging position and defining a second joint edge contact line;

d) said first and second joint edge contact lines being horizontally displaced a predetermined distance from each other transversely of the weld line;

e) said pairs of gauging elements in their gauging position being positioned so that when said joint edges are brought into contact with corresponding pairs of gauging elements the joint edges are in predetermined relationship to said weld line;

f) a clamping sub-system connected to said support structure for clamping said sheet metal components with said joint edges in said predetermined relationship to said weld line;

g) said gauging sub-system further including at least one device for retracting said pairs of gauging elements into said retracted position after said sheet metal components are clamped; and

h) an edge butting sub-system connected to said support structure for moving at least one of said sheet metal components toward the other of said sheet metal components after said gauging elements are retracted to bring said joint edges into butting relationship along said weld line.

5,814,787

APPARATUS FOR WELDING STEEL BARS IN A CONTINUOUS HOT ROLLING PROCESS

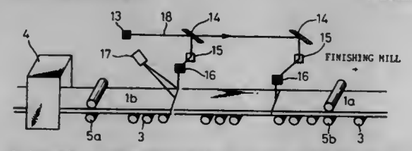
Shigeru Nishibayashi; Masahiro Ohara, both of Futtsu; Katsuhiro Minamida, Sagamihara; Tadatsugu Yoshida; Rokuro Kohno, both of Futtsu, and Atsushi Sugihashi, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 307,733, Sep. 23, 1994. This application Nov. 18, 1996, Ser. No. 751,284

Claims priority, application Japan, Jan. 28, 1993, 5-012471; Mar. 31, 1993, 5-074335; Sep. 22, 1993, 5-236912

Int. Cl.[6] B23K *26/04;26/08*

U.S. Cl. 219—121.64 **4 Claims**



1. A continuous hot-rolled sheet bar welding apparatus by which the tail of a preceding sheet bar and the top of a succeeding sheet bar are butted and welded while continuously moving in a rolling direction in a hot rolling line, said apparatus comprising:

a movable main body traveling device capable of traveling by itself in the rolling direction independent of the continuous movement of the butted sheet bars in the hot rolling line to a position of not less than 4.9 m from an initial position at a distance from a fixed laser beam source while being opposed to the fixed laser beam source,

said movable main body traveling device including:

a rolling direction movable reflecting mirror mounted on the main body traveling device for movement with respect to the main body traveling device in the rolling direction independent of movement of the main body traveling device for adjusting to a welding line defined by the butted sheet bars,

a vertical direction movable reflecting mirror mounted on the main body traveling device for movement with respect to the main body traveling device perpendicular to the rolling direction independent of movement of the main body traveling device for adjusting to thickness change of the sheet bars,

a width direction focusing unit mounted on the main body traveling device for movement with respect to the main body traveling device transverse to the rolling direction independent of movement of the main body traveling device for conducting a melting welding operation, and

means for detecting a welding position of the butted sheet bars, said means detecting said welding position while said main body traveling device travels by itself in the rolling direction of the hot rolling line.

5,814,788

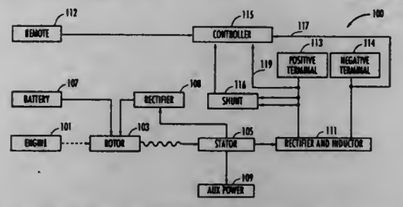
METHOD AND APPARATUS FOR ELECTRONIC CONTROL OF THE OUTPUT OF AN ENGINE DRIVEN, CHOPPED DC WELDING POWER SUPPLY, DRIVEN BY AN AC GENERATOR

Donald A. Everhart, Fond du Lac, and Neal E. Roebke, Appleton, both of Wis., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 14, 1995, Ser. No. 527,958

Int. Cl.[6] B23K *9/073*

U.S. Cl. 219—133 **14 Claims**



1. An engine driven welding power supply for providing a welding output having a plurality of volt ampere curves, each of the curves being associated with a selected current output, comprising:

an ac generator capable of providing an ac signal;

rectifier means for receiving the ac signal and providing a chopped dc signal;

output inductor means for receiving the chopped dc signal and providing a smoothed dc output,

controller means, connected to the rectifier means, for providing each welding volt ampere curve a slope over a usable arc welding range, wherein the slope is associated with the selected current, and wherein the magnitude of the slope is dependent on the selected current output, and the slope varies for output currents at least under 100 amps.

5,814,789

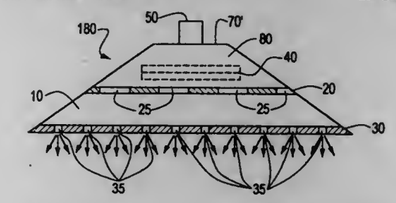
FORCED CONVECTION FURNANCE GAS PLENUM

Brian O'Leary, Evanston, Ill.; David S. Harvey, Littleton, Mass.; Francis C. Nutter, Methuen, Mass., and Martin I. Soderlund, Westborough, Mass., assignors to BTU International, Inc., North Billerica, Mass.

Filed Jul. 18, 1996, Ser. No. 685,243

Int. Cl.[6] H05K *3/34;* **F27B** *9/10*

U.S. Cl. 219—388 **19 Claims**



1. A gas plenum for a forced convection furnace comprising:

a housing;

a gas supply communicating with and providing gas to said housing;

an orifice plate forming at least a portion of a surface of said housing, said orifice plate having a plurality of metering holes;

a heating plate disposed within said housing above said orifice plate, said heating plate having a plurality of apertures, said heating plate and a first portion of said housing defining a heating chamber;

a mixing chamber formed by said heating plate, said orifice plate and a second portion of said housing; and

at least one heating element disposed within said heating chamber.

5,814,790

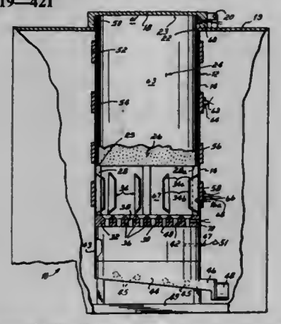
APPARATUS AND METHOD FOR LIQUIFYING THERMOPLASTIC MATERIAL

Benjamin J. Bondeson, Buford; Paul S. Frates, Lawrenceville; Gregory J. Gabryszewski, Lithonia, and Peter J. Petrecca, Dunwoody, all of Ga., assignors to Nordson Corporation, Westlake, Ohio

Filed Oct. 4, 1995, Ser. No. 539,295

Int. Cl.[6] B67D *5/62;* **F27B** *14/14*

U.S. Cl. 219—421 **14 Claims**



1. Apparatus for liquifying and supplying liquified thermoplastic material, the apparatus comprising:

a thin-walled hopper having a first space in an upper interior portion of the hopper for receiving and partially melting thermoplastic material and a second space in a lower interior portion of the hopper for more fully melting the thermoplastic material;

a first heater operatively connected to said first space;

a second heater operatively connected to said second space;

a third heater operatively connected to said first space;

a melting grid mounted in a lower portion of the second space for receiving thermoplastic material thereon;

a fourth heater operatively connected to said melting grid; and

a control connected to the four heaters, wherein the control operates said first heater independently of the second and fourth heaters such that said first heater and said second and fourth heaters may be operated to heat and maintain said first and second spaces at different temperatures, and the control further operates said third heater independently of said first and second heaters;

whereby heat may be quickly transferred through the thin-walled hopper and multiple, independently controlled heating zones disposed along the hopper may be maintained at different temperatures by the respective, independently controlled heaters.

5,814,791

ELECTRICAL APPARATUS WITH A VARIABLE CIRCUIT PROTECTION DEVICE

Wallace C. Rudd, New Canaan, Conn., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Jun. 17, 1997, Ser. No. 877,595

Int. Cl.[6] H05B *1/02*

U.S. Cl. 219—504 **10 Claims**

10. An electrical assembly comprising:

(a) a first electrical circuit comprising a PTC circuit protection device composed of a conductive polymer composition and two electrodes, the PTC device being electrically connected in series with a resistive load and a first power supply;

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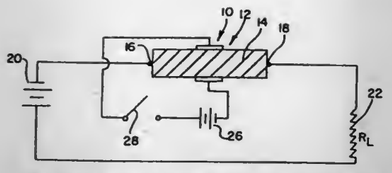


(1) the circuit having a normal operating condition in which a current, i_n, flows through the PTC device and the device has a temperature, T_n, and the PTC device has a resistance, R_n, there is a stable equilibrium between a rate at which the PTC device generates heat by I^2R heating and a rate at which heat is lost from the device, and the device having an electrical power/temperature relationship such that if a fault condition is introduced into the circuit;

(2) the current flowing through the PTC device increases from i_n and the temperature of the PTC device increases from T_n until the stable equilibrium between the rate at which the device generates heat by I^2R heating and the rate at which heat is lost from the device becomes unstable, at which unstable equilibrium point the current flowing through the PTC device is i_{crit}, and the PTC device has a critical temperature, T_{crit}, and a critical resistance, R_{crit};

(3) if the fault condition introduced into the circuit continues and the current flowing through the PTC device increases to a point greater than i_{crit}, the rate at which the device generates heat by I^2R heating exceeds the rate at which heat can be lost from the device, thus, causing the temperature and the resistance of the PTC device to rise rapidly and the circuit current to decrease until a high temperature, high resistance stable equilibrium point is reached at which the rate at which the PTC device generates heat by I^2R heating is equal to the rate at which heat can be lost from the PTC device, at the high temperature, high resistance stable equilibrium point the device has a resistance, R_{high}, and a temperature, T_{high}, and a limited current, i_{limit}, flows through the device; and

(b) a second circuit in electrical contact with the PTC device such that the second circuit may introduce a secondary electrical current, i_{sec}, into the PTC device such that $i_{sec}+i_n$ is less than i_{crit}, the increased current flowing through the PTC device causes the I^2R heat generated by the PTC device to increase thus creating a new normal operating condition where the PTC device has a temperature T_n, which is between T_n and T_{crit} and a resistance R_n, which is between R_n and R_{crit}.

5,814,792

EXTRA-LOW VOLTAGE HEATING SYSTEM

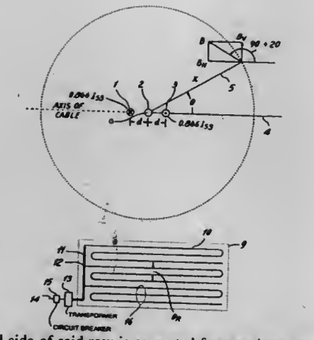
Theodore Wildi, Quebec, Canada, assignor to Sperika Enterprises Ltd., Quebec, Canada

Filed Jun. 26, 1996, Ser. No. 670,413

Int. Cl.[6] H05B *3/44;1/00;* **H01C** *3/02;* **H04B** *3/28*

U.S. Cl. 219—544 **24 Claims**

1. An extra-low-voltage heating system for heating a surface area, said system comprising at least one cable having three conductive heating wires contained in an insulated sheath, an adequate supply source of 30 volts or less, feeder conductor means connected to said supply source, said heating wires being connected at one end to said feeder conductor means, said wires having low resistivity similar to that of copper, said at least one cable and said wires therein being permanently fixed in a parallel run configuration relative to said surface area to be heated; said three heating wires of said cable being arranged in a row, said cable being of substantially rectangular cross-section with said row lying on a horizontal axis of said cable, an outer one of said three wires on a left-hand side of said row is separated from an inner one of said three wires of said row by a distance d, as measured from a center of said wires, an outer one of said three wires on a



right-hand side of said row is separated from an inner one of said three wires of said row by a distance d, as measured from a center of said wires, said three heating wires being connected together at a far end of said cable, and wherein a conductive extension of each of said three wires at a near end of said cable constitute connecting leads of a star cable, said connecting leads containing a marking to identify their respective conductive extension to said right-hand side wire, said left-hand side wire and said inner wire of said row of said star cable, said surface area being a surface forming material having a surface to be heated by said cables, and a plurality of said cables being oriented and retained in cable runs disposed in parallel relationship to one another in a common plane and at a predetermined distance D_R between each other, said distance D_R between adjacent cable runs of said plurality of cables being given by the formula

$$D_R=P_C/P_D$$

wherein D_R is expressed in meters, P_D is the desired heating power density expressed in watts per square meter, and P_C is said desired thermal power per unit length of said cable, expressed in watts per meter, said cable having a length (L) based on specific parameters of said system including (i) the operating voltage (E) of said supply source, (ii) the number of phases of said supply source, (iii) the total cross sectional dimension (A) of said three heating wires, (iv) the resistivity (ρ) of the wire material, and (v) the desired thermal power per unit length (P_C) of said cable, whereby the resultant flux density at a given distance H perpendicular to the plane of said horizontal axes of said cables, is less than a specific value B when current is applied to said heating wires in said cables, specific value B being calculated from a set of parameters including said distance d between the wires, the total cross section A of all said wires in said cable, the said thermal power per unit length P_C of said cable, the said resistivity ρ of the wire material and wherein said distance H is less than a specific multiple of said distance D_R.

5,814,793

AIR FLOW SYSTEM FOR MICROWAVE OVENS

Kyu Moon Yu, Gyeongnam, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed May 2, 1996, Ser. No. 643,135

Claims priority, application Rep. of Korea, May 16, 1995, 1995/12082

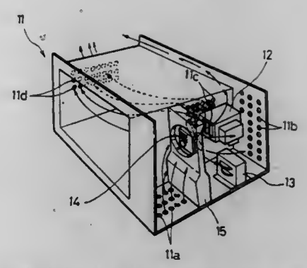
Int. Cl.[6] H05B *6/64*

U.S. Cl. 219—757 **4 Claims**

1. An air flow system for microwave ovens comprising:

an oven casing surrounding a cooking cavity having a plurality of air guide holes on one side wall thereof and a plurality of air exhaust holes on another side wall thereof;

said oven casing surrounding said cooking cavity and a space between a sidewall of said cooking cavity and one side wall of said casing, said casing having a plurality of air guide inlet



and outlet holes on a bottom and rear wall thereof, respectively, at portions outside said cooking cavity;

a magnetron mounted in said space inside said casing adjacent said air guide holes;

a high voltage transformer mounted in said space at a position adjacent said air guide holes formed on the bottom of said casing;

an air guide wall mounted in said space at a position separating said air guide inlet holes from both the magnetron and the transformer; and

a fan mounted in said air guide wall and adapted to draw outside air into said space through said air inlet holes and to direct a portion of the outside air toward both the magnetron and the transformer and another portion of the outside air into the cooking cavity.

5,814,794

TEMPERATURE CONTROL APPARATUS OF MICROWAVE OVEN AND METHOD THEREOF

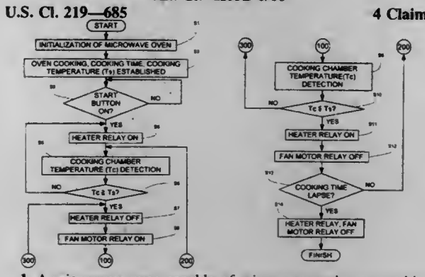
Gyu-Sik Lim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 28, 1996, Ser. No. 613,768

Claims priority, application Rep. of Korea, Feb. 28, 1995, 1995/4212

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—685 **4 Claims**



1. A microwave oven capable of microwave and oven cooking operations, comprising:

a cooking chamber;

a magnetron for performing microwave cooking in the cooking chamber;

an electrical heater for performing oven cooking in the cooking chamber;

a passage for conducting outside air into the cooking chamber;

a motor-driven fan in the passage for inducing a flow of outside air into the cooking chamber;

a temperature detector for detecting a temperature in the cooking chamber;

a user input mechanism enabling a user to select between microwave and oven cooking operations and for setting a cooking temperature in an oven cooking operation; and

a control mechanism connected to the fan and the temperature detector for deactivating the fan and activating the electrical heater while the detected temperature is below the cooking temperature during an oven cooking operation, and for actuating the fan and deactivating the electrical heater while the detected temperature is above the cooking temperature during an oven cooking operation.

5,814,795

NUXILIARY COOKING DEVICE FOR MICROWAVE OVENS

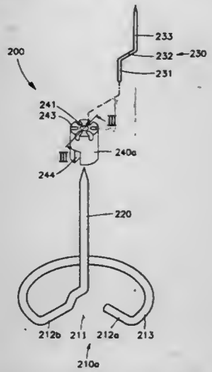
Dae-Rae Kim, and Jeong-Hee Lee, both of Suwon-City, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon-City, Rep. of Korea

Filed Jun. 5, 1997, Ser. No. 869,287

Claims priority, application Rep. of Korea, Jun. 12, 1996, 1996-15590 U; Aug. 12, 1996, 1996-33441; Aug. 12, 1996, 1996-33442; Apr. 8, 1997, 1997-12894

Int. Cl.[6] H05B *6/80;* **A47J** *37/04*

U.S. Cl. 219—732 **9 Claims**



1. A microwave oven comprising a cooking chamber and an auxiliary cooking device disposed therein for supporting foodstuffs to be cooked, the auxiliary cooking device comprising:

a main structure including:

a supporting base for supporting the auxiliary cooking device in the cooking chamber; and

a coupling member connected to the supporting base, the coupling member having formed therein a plurality of generally vertical inserting holes, and a plurality of generally horizontal upper grooves formed in a top surface of the coupling member and projecting outwardly from upper ends of respective ones of the inserting holes;

a main fixing bar for supporting large foodstuffs and projecting upwardly from the top surface of the coupling member; and

auxiliary fixing bars for supporting small foodstuffs and being removably mounted on the coupling member; each of the auxiliary fixing bars including a first generally vertical bar section removably inserted into a respective one of the inserting holes, a generally horizontal bar section having first and second ends, the first end formed of one integral piece with an upper end of the first vertical bar section, the generally horizontal bar section seated in a respective one of the upper grooves for preventing the auxiliary fixing bar from rotating relative to the coupling member, and a second generally vertical bar section formed of one integral piece with the second end of the generally horizontal bar section and extending upwardly therefrom for receiving foodstuff to be cooked.

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5,814,796

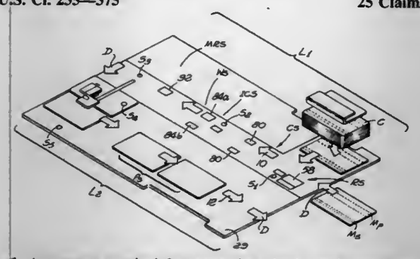
TERMINAL FOR ISSUING AND PROCESSING DATA-BEARING DOCUMENTS

Terrence R. Benson, Redondo Beach; Richard Jablonski, Rancho Palos Verdes; Lawrence V. Maldarelli, Tustin, and Howard Siu, South San Gabriel, all of Calif., assignors to Mag-Tek, Inc., Carson, Calif.

Filed Jan. 31, 1996, Ser. No. 594,812

Int. Cl.[6] G06K *1/00;19/06*

U.S. Cl. 235—375 **25 Claims**



1. A compact terminal for processing plastic cards, said cards bearing personalized human-readable and machine-readable data, said terminal comprising:

a housing defining a segmented horizontal path between an entry port and an exit port on which a card is transported within the terminal, said path comprising respective spaced-apart first and second segments disposed on each end of a lateral segment, said first and second segments disposed in substantially parallel relationship and defining respective opposite directions of transport;

a receiving station positioned adjacent said entry port for feeding said cards onto said path;

a magnetic transducer for processing at least a portion of said machine-readable data;

a printer for printing said human-readable data; and

a transport system within said terminal for transporting said cards on said path, said transport system comprising a mechanism laterally transporting said card between said first and second segments and along said lateral segment.

5,814,797

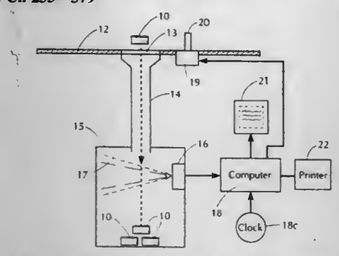
TRANSPONDER SYSTEM FOR MONITORING AND LOGGING DEPOSITORY TRANSACTIONS

Michael S. Rifkin, Kingston, Pa., assignor to A Rifkin CO., Wilkes-Barre, Pa.

Filed Nov. 4, 1996, Ser. No. 743,621

Int. Cl.[6] G06K *19/06*

U.S. Cl. 235—379 **9 Claims**



1. A transponder system to monitor and log depository transactions in which a plurality of bags loaded with funds to be deposited in a bank are put one at a time, into an inlet hopper on the outside of the bank, from which they pass through a chute to fall into a vault inside the bank, each bag in the plurality thereof being identified by a number that is different from the numbers identifying the other bags in the plurality, said system comprising:

A. a passive transponder tag incorporated in each of said bags adapted to receive a radio-frequency interrogation signal and to retransmit the signal as a digitally-coded signal defining the number identifying the bag;

B. a powered transceiver installed in the vault adapted to transmit said interrogation signal in a confined field within the vault whereby as each of said bags falls through the chute into the vault in the course of which it passes through said field, the transponder in the bag then picks up the interrogation signal and transmits the digitally-coded signal to said transceiver; and

C. computer means coupled to said transceiver and responsive to the coded signals received thereby to register the number of each bag falling into the vault and to clock the time and date at which this action occurs to provide a log of depository transactions.

5,814,798

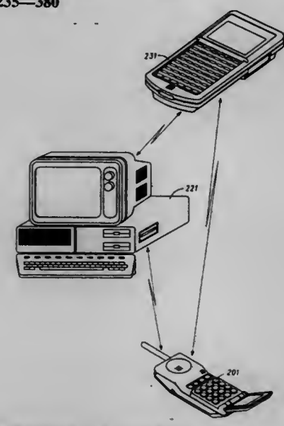
METHOD AND APPARATUS FOR PERSONAL ATTRIBUTE SELECTION AND MANAGEMENT USING PREDICTION

William F. Zancho, Hawthorn Woods, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 366,209, Dec. 29, 1994, Pat. No. 5,633,484. This application May 23, 1997, Ser. No. 862,660

Int. Cl.[6] G06K *05/00*

U.S. Cl. 235—380 **41 Claims**



1. An application device comprising:

a port for coupling with a donor device having preferences;

a session preference memory;

a user interface device;

a controller operatively coupled to said user interface device, said port and said session preference memory to access the donor device via the port to provide to the donor device access information for access of the donor device, to receive preferences from the donor device in response to the access information, to obtain predicted preferences using a prediction procedure in at least one of the application device and the donor device, to store both the specific preferences and the predicted preferences in said session preference memory, to refine the predicted preferences through user interaction with said user interface device to produce refined user preferences, and to transmit the refined preferences to the donor device to update a reference preference set in the donor device.

5,814,799

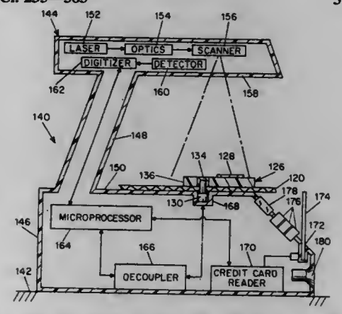
SELF-CHECKOUT, POINT-OF-TRANSACTION SYSTEM INCLUDING REMOVABLE, ELECTRO-OPTICALLY CODED SURVEILLANCE TAGS

Jerome Swartz, Old Field, and William Tracy, Floral Park, both of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Division of Ser. No. 919,410, Jul. 27, 1992, Pat. No. 5,594,228, which is a continuation-in-part of Ser. No. 728,575, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 414,450, Sep. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 236,249, Aug. 25, 1988, abandoned. This application Nov. 12, 1996, Ser. No. 747,553

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—383 **3 Claims**



1. A point of-transaction system for processing articles having attached surveillance tags, each surveillance tag having an activated state and a deactivated state, each of the surveillance tags bearing coded indicia and being initially in an activated state, the point-of-transaction system defining a deactivated region in space in which only one of the surveillance tags at a given time may be positioned in order to change the surveillance tag from an activated state into a deactivated state, the system comprising:

a) a plurality of surveillance tags, each surveillance tag being attached to one of a plurality of articles available for purchase, each tag bearing coded indicia;

b) a deactivator for deactivating a selected one of the plurality surveillance tags positioned in the deactivation region;

c) a reader for electro-optically reading the indicia on the selected one of the plurality of tags while the tag is positioned in the deactivation region and when a reader activation signal is obtained; and

d) a controller for detecting when the deactivator deactivates the selected one of the plurality of tags and for forming a reader activation signal.

5,814,800

DEVICE FOR DETECTING THE USE OF FALSE CARDS BY READING EMBOSSED CHARACTERS

Peter Marsh, Preston, and Iain Andrew James Lamont, Nr. Clitheroe, both of England, assignors to Meggitt Ltd., England

Filed Jun. 30, 1995, Ser. No. 497,226

Claims priority, application United Kingdom, Jun. 30, 1994, 9413121

Int. Cl.[6] G06K *7/04;5/00;* **G06F** *17/00*

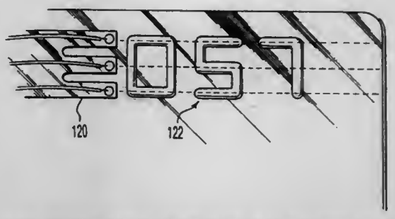
U.S. Cl. 235—448 **3 Claims**

1. A card reader detecting the use of false cards, each said card including a magnetic strip, and at least selected cards having shaped markings, said card reader comprising:

a card support;

a detector support in fixed spatial relationship to said card support;

three detectors mounted on said detector support;



means enabling relative displacement of a card being read and said detectors in a longitudinal direction;

a follower apparatus consisting of three followers mechanically connected respectively to said three detectors, said followers being mutually separated in a lateral direction and being positioned to contact upper, middle and lower portions respectively of shaped characters on said card, if present and to move in response to said contact, said movement by said followers being detected by the respective detectors;

mechanical biasing means for urging said followers toward said card being read;

magnetic reading means for reading information stored on the magnetic strip of said card being read; and

electronic response means electrically connected to said detectors and said magnetic reading means, said electronic response means for classifying any shaped marking detected by said detectors and said followers into one of at least two classes of possible shaped markings having the detected shape and for comparing the class of possible shaped markings having the detected shape to information stored on the magnetic strip as read by the magnetic reading means, wherein each said class of possible shaped markings having the detected shape includes at least two different possible shaped markings.

and wherein said relative displacement of the card being read and said detectors causes shaped markings, if present on said card, to move past said followers, thereby causing displacements of said followers which are detected by said detectors which send corresponding signals to said electronic response means which verifies said shaped markings against the magnetic strip.

5,814,801

MAXICODE DATA EXTRACTION USING SPATIAL DOMAIN FEATURES EXCLUSIVE OF FOURIER TYPE DOMAIN TRANSFER PROCESSING

Yujiun P. Wang, and Angi Ye, both of Fort Myers, Fla., assignors to Metanetics Corporation, Bothel, Wash.

Division of Ser. No. 456,113, May 31, 1995, Pat. No. 5,637,849. This application Nov. 1, 1996, Ser. No. 742,367

Int. Cl.[6] G06K *7/10;7/14;19/06*

U.S. Cl. 235—454 **16 Claims**

13. A method of extracting data from a dataform having a pattern of rows of similarly aligned lighter and darker data cells of a regular polygon shape, comprising the steps of:

(a) providing pixel data for an image area, said pixel data representative of reflected images of said data cells;

(b) determining, by the presence of illumination value transitions spaced at integral multiples of data cell width, the orientation of a normal traversal line having an alignment normal to sides of a series of said data cells positioned in a row in side-to-side straight line alignment;

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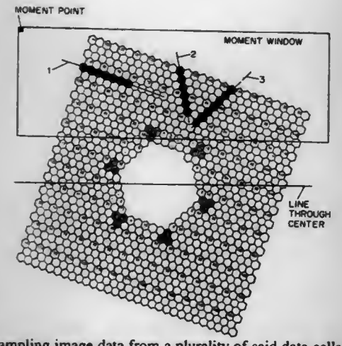


(c) sampling image data from a plurality of said data cells along a sampling line traversing each data cell of said plurality; and

(d) extracting data from said sampled image data.

5,814,802

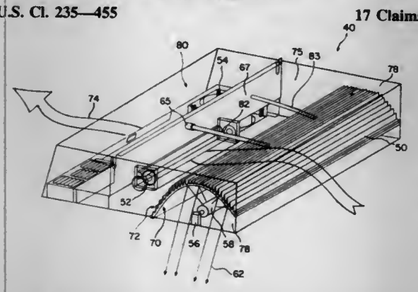
HIGH SPEED IMAGING APPARATUS FOR CCD BASED SCANNERS

Kurt Hecht, Hartsville, and Richard A. Di Domizio, Hatfield, both of Pa., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Filed Feb. 23, 1996, Ser. No. 606,426

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—455 **17 Claims**



1. An apparatus for imaging an object within a predetermined region comprising:

means for illuminating the region comprising:

means for producing light;

reflector means for directing said light toward said region; and

said reflector means including means integral with said reflector means for removing heat generated by said light producing means;

detecting means for receiving reflected light from said object when disposed within the region;

means for focusing reflected light onto said detecting means; and

means for monitoring the intensity of said light producing means comprising a photo sensitive element and means for transmitting light from said light producing means to said element.

5,814,803

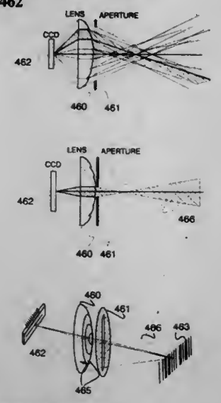
IMAGE READER WITH MULTI-FOCUS LENS

Bryan L. Olmstead; Michael J. Ahten; Bruce E. Paris; Jorge L. Acosta; James W. Ring; Paul R. Huss; Jon P.C. Williams; Alexander M. McQueen, and Randy L. Person, all of Eugene, Oreg., assignors to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Continuation-in-part of Ser. No. 363,258, Dec. 23, 1994. This application Dec. 21, 1995, Ser. No. 576,203

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **18 Claims**



1. A bar code reader comprising

a multi-focus ambient light gathering system comprising a lens having a plurality of zones, each zone having a different focal length;

means for reducing interference between said zones caused by simultaneous gathering of ambient light;

a photo-sensitive detector outputting a signal having an amplitude varying in response to lighter and darker portions of a read image; and

a decoder coupled to said signal.

5,814,804

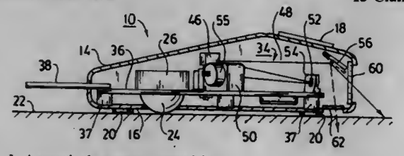
OPTICAL SCANNER ACTIVATED WITH POSITION LOCATOR

David Kostizak, Rochester, N.Y., assignor to PSC Inc., Webster, N.Y.

Continuation of Ser. No. 522,054, Aug. 31, 1995, abandoned, which is a continuation of Ser. No. 975,760, Nov. 13, 1992, Pat. No. 5,448,050. This application Sep. 16, 1996, Ser. No. 714,499

Int. Cl.[6] G06R *7/10*

U.S. Cl. 235—472 **15 Claims**



1. An optical scanner comprising:

a universally movable body;

an optical scanning engine mounted on the movable body, the optical scanning engine being adapted to direct scanning light toward a surface, receive the scanning light reflected off the surface, and output a first signal representative of a scanned data from the surface;

a position sensor mounted on the movable body, the position sensor being adapted to output a second signal indicative of movement of the movable body; and

means for automatically activating the scanning engine upon the second signal indicating that the movable member is positioned in an area where a symbol to be scanned is located.

5,814,805

CHIP-CARD READER

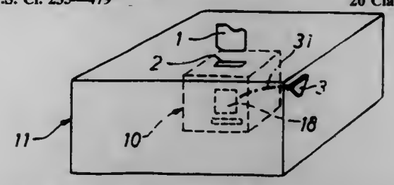
Manfred Reichardt, Weinsberg, and Martina Tolksdorf, Sontheim, both of Germany, assignors to Amphenol-Tuchel Electronics GmbH, Heilbronn, Germany

Filed Jul. 29, 1996, Ser. No. 687,997

Claims priority, application Germany, Jul. 27, 1995, 195 27 519.5

Int. Cl.[6] G06K *13/04*

U.S. Cl. 235—479 **20 Claims**



1. A chip card reader comprising:

reading contact elements adapted to engage card contacts of said chip card in a reading position;

a receptacle into which said chip card is inserted; and

actuating means adapted to bring said card contacts and said contact elements into contact engagement by moving said receptacle, and therefore said chip card, towards said reading contact elements.

5,814,806

CODE SHEET REPRESENTING MULTIPLE CODE INFORMATION AND METHOD FOR PRODUCING THE SAME

Yasuhiro Tanaka, Ashiya; Hiroaki Okayama, Yamatotakada; Shusuke Ono, Takatsuki; Kazutake Boku, Yao; Michihiro Yamagata, Osaka; Katsu Yamada, Matsubara; Yoshiharu Yamamoto, Toyonaka, and Motonobu Yoshikawa, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 340,169, Nov. 15, 1994, abandoned. This application Dec. 26, 1996, Ser. No. 774,158

Claims priority, application Japan, Nov. 16, 1993, 5-286379

Int. Cl.[6] G06K *19/06*

U.S. Cl. 235—494 **28 Claims**

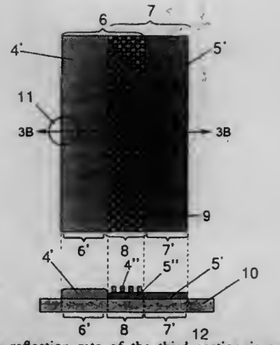
1. A code sheet representing first code information and second code information, the code sheet comprising:

a printing medium including a first region in which the first code information is to be printed, a second region in which the second code information is to be printed, and a third region in which the first code information and the second code information are to be printed;

a first section formed on a region of the first region of the printing medium excluding the third region, the first section being made of a first printing material;

a second section formed on a region of the second region of the printing medium excluding the third region, the second section being made of a second printing material different from the first printing material; and

a third section formed only on the third region of the printing medium, the third section including a portion made of the first printing material and a portion made of the second printing material;



wherein a reflection rate of the third section is substantially equal to a reflection rate obtained by averaging a reflection rate of the first printing material and a reflection rate of the second printing material with respect to light in a first wavelength band and light in a second wavelength band,

and wherein the first second and third regions are separate and distinct.

5,814,807

OPTICAL PICK-UP HEAD AND INTEGRATED TYPE OPTICAL UNIT FOR USE IN OPTICAL PICK-UP HEAD

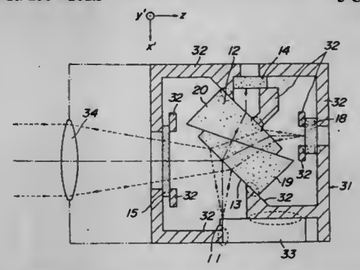
Toru Musha, Hachioji; Akihiko Yoshizawa, Kanagawa; Hiroyuki Imabayashi, Machida, and Hiroshi Miyajima, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 447,208, May 22, 1995. This application Apr. 25, 1997, Ser. No. 840,723

Claims priority, application Japan, May 20, 1994, 6-107065; Jul. 14, 1994, 6-162291; Jul. 22, 1994, 6-171107; Sep. 26, 1994, 6-229597

Int. Cl.[6] G02B *7/04;27/64;* **G11B** *7/00*

U.S. Cl. 250—201.5 **5 Claims**



1. An integrated type optical unit for use in an optical pick-up head for reading and/or recording information from and/or on an optical record medium by projecting a light flux emitted from a semiconductor laser onto an optical record medium and by receiving a return beam reflected by the optical record medium by means of a signal detecting photodetector, wherein said semiconductor laser, signal detecting photodetector and a light path separating element for directing the light beam emitted by the semiconductor laser toward the optical record medium and directing the return beam reflected by the optical record medium toward the photodetector are positioned and mounted on a mounting substrate including positioning guides formed by a photolithography.

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5,814,808

OPTICAL DISPLACEMENT MEASURING SYSTEM USING A TRIANGULATION INCLUDING A PROCESSING OF POSITION SIGNALS IN A TIME SHARING MANNER

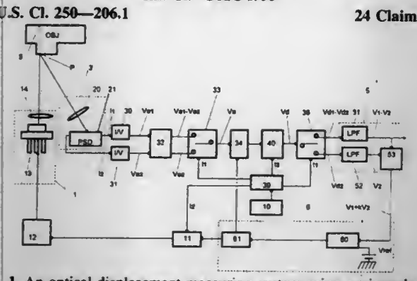
Yuji Takada, Kyoto; Hiroshi Matsuda, and Takayuki Nishikawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 27, 1996, Ser. No. 703,787

Claims priority, application Japan, Aug. 28, 1995, 7-219332; May 28, 1996, 8-157679; May 28, 1996, 8-157680

Int. Cl.[6] G01C *3/06*

U.S. Cl. 250—206.1 **24 Claims**



1. An optical displacement measuring system using a triangulation comprising:

a light projecting means for emitting a light beam, which is amplitude-modulated by a reference signal having a predetermined period, to an object;

a position signal generator for receiving light reflected by said object and providing a pair of first and second position signals;

a control signal generating means for providing first and second control signals in synchronism with said reference signal;

a first switching means for processing said first and second position signals in a time sharing manner according to said first control signal to obtain a first composite signal, in which said first and second position signals occur alternately and occur once every n periods of said reference signal, where n is a positive integer;

a single amplifying means for amplifying said first composite signal at a desired amplification rate; and

a distance determining means for periodically reversing the polarity of said first composite signal provided from said amplifying means according to said second control signal so as to obtain a second composite signal, and determining a distance between said light projecting means and said object from said second composite signal.

5,814,809

APPARATUS FOR OPTICALLY SCANNING IMAGES USING TRANSMISSIVE AND REFLECTIVE LIGHT SOURCES

Loi Han, Alhambra, Calif., assignor to Microtek International, Inc., Hsinchu, Taiwan

Continuation-in-part of Ser. No. 393,112, Feb. 21, 1995, Pat. No. 5,574,274. This application Aug. 5, 1996, Ser. No. 692,540

Int. Cl.[6] H04N *1/04*

U.S. Cl. 250—208.1 **20 Claims**

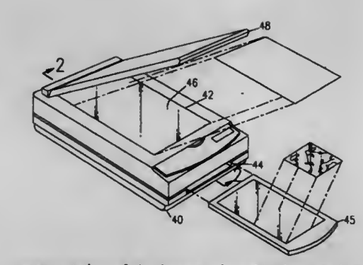
1. A transmissive/reflective optical scanning apparatus comprising:

a scanner housing;

a reflective scanning platform;

a transmissive scanning platform;

a scanning camera including a scanning camera chassis moveable relative to said reflective and transmissive scanning platforms and further including, mounted on said scanning camera chassis, a transmissive light source and a reflective light source, a digital camera adapted to generate electrical signals



representative of the images viewed, a lens, and an optical pathway which is oriented to selectively view said platforms; and

said scanning camera adapted to selectively view said platforms and generate electrical signals representative of the images viewed.

5,814,810

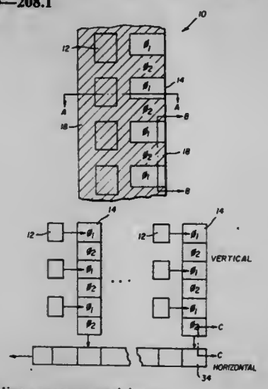
INTERLINE SENSOR EMPLOYING PHOTOCAPACITOR GATE

Constantine N. Anagnostopoulos, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 636,434, Apr. 23, 1996. This application Sep. 18, 1997, Ser. No. 933,304

Int. Cl.[6] H01L *27/00;* **G11C** *19/28;* **H03K** *23/46*

U.S. Cl. 250—208.1 **6 Claims**



1. An interline sensor comprising:

a silicon substrate;

at least one vertical shift register within the substrate, the vertical shift register having a plurality of electrodes for shifting charge through the electrode;

a plurality of photodetectors within the substrate adjacent the vertical shift register, each photodetector comprising a photocapacitor;

a barrier region between each photodetector and the vertical shift register;

means for applying a first potential level and a second potential level to the electrodes of the vertical shift register;

single phase means for allowing the transfer of charge from the photocapacitor to the vertical shift register in a uniphase mode by adjusting the potential applied to only one of the electrodes of the vertical shift register;

a third level clock operatively coupled to one phase of vertical shift register for each photocapacitor; and

at least one horizontal shift register operatively coupled to receive charge from the vertical shift register.

5,814,811

Patent Not Issued For This Number

5,814,812

DEVICE FOR FILTERING OF HARMONIC SIGNAL COMPONENTS

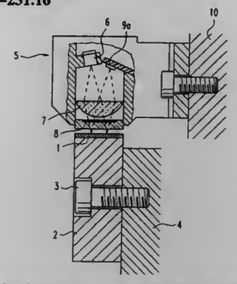
Wolfgang Holzapfel, Obing, Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Germany

Filed Aug. 28, 1996, Ser. No. 704,832

Claims priority, application Germany, Sep. 1, 1995, 195 32 246

Int. Cl.[6] G01D *5/34*

U.S. Cl. 250—231.16 **9 Claims**



1. A device for filtering harmonic signal components, the device comprising:

a scale having scale graduation markings sequentially arranged in a measuring direction;

a scanning unit having scanning graduation markings sequentially arranged in the measuring direction wherein a scanning signal is created during the scanning of the scale graduation markings by the scanning graduation, said scanning signal consisting of a fundamental wave and even harmonic signal components wherein either the scale graduation markings or the scanning graduation markings do not have an equidistant spacing interval but rather have a definite shift from an equidistant spacing interval, wherein said shift causes a resulting phase shift of said even harmonic signal components, the shift being chosen so that a n-th even harmonic signal component is eliminated by virtue of said resulting phase shift, while said fundamental wave remains unchanged.

5,814,813

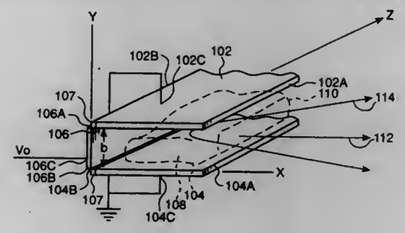
END CAP REFLECTION FOR A TIME-OF-FLIGHT MASS SPECTROMETER AND METHOD OF USING THE SAME

Robert J. Cotter, and Timothy J. Cornish, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 8, 1996, Ser. No. 677,033

Int. Cl.[6] B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—287 **31 Claims**



1. A reflectron for use with a mass spectrometer that focuses ions having different energies comprising:

a conductive end cap electrically connected to a first voltage and having an end cap inner surface;

a conductive surface electrically isolated from said conductive end cap and connected to a second voltage, said conductive surface and said end cap inner surface defining an inner region in which a non-linear electric field exists so that said ions having different energies enter and exit said inner region at an opening formed in said conductive surface and, when within said inner region, are reflected out of said opening as a result of said electric field without penetrating past said conductive surface.

5,814,814

ELECTRON MICROSCOPE

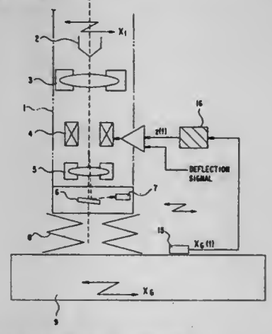
Yoichi Kanemitsu, Fukuoka-ken, and Katsuhide Watanabe, Kanagawa-ken, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Feb. 27, 1996, Ser. No. 607,613

Claims priority, application Japan, Feb. 28, 1995, 7-065130

Int. Cl.[6] H01J *37/244*

U.S. Cl. 250—310 **3 Claims**



1. An electron microscope comprising:

an electron gun for emitting an electron beam;

a specimen holder for holding a specimen thereon;

a deflection coil for applying the electron beam from said electron gun to the specimen on said specimen holder;

a vibration sensor for detecting vibrations of said electron gun and producing a signal representing detected vibrations of said electron gun;

a vibration sensor for detecting vibrations of said specimen holder and producing a signal representing detected vibrations of said specimen holder;

means for combining said signals representing vibrations of said electron gun and said specimen holder to produce a differential signal representing a difference therebetween; and

a controller for generating a control signal representing relative vibrations between said electron gun and said specimen holder on the basis of said differential signal and adding said control signal as a control signal to a deflection signal for said deflection coil for thereby effecting feedforward control of the electron beam to cause the electron beam to reach the specimen on said specimen holder.

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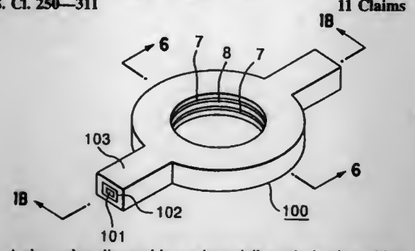
5,814,815

PHASE-CONTRAST ELECTRON MICROSCOPE AND PHASE PLATE THEREFOR

Takao Matsumoto; Nobuyuki Osakabe, and Akira Tonomura, all of Saitama-Ken, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1996, Ser. No. 768,355
Claims priority, application Japan, Dec. 27, 1995, 7-340270
Int. Cl.[6] H01J *37/26*
U.S. Cl. 250—311 11 Claims



1. A phase plate disposed in a substantially optical-axis position in the vicinity of a back focal plane of an objective lens of an electron microscope and shaped in ring form, comprising:

a ring-shaped microelectrode covered with conductors adapted so as to expose a ring inner surface through which electrons corresponding to a focused electron beam of a direct wave formed in said substantially optical-axis position pass and to interpose said microelectrode between said conductors with insulators interposed therebetween; and

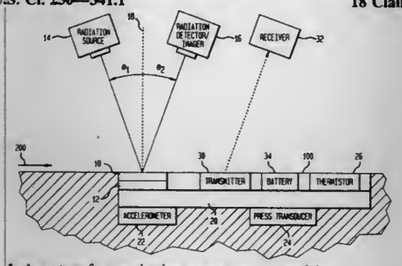
a conductor for introducing an external potential into said microelectrode.

5,814,816

SYSTEM FOR MONITORING SURFACE STRESS AND OTHER CONDITIONS IN STRUCTURES

Richard H. Nadolink, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1996, Ser. No. 716,665
Int. Cl.[6] G01L *1/24*
U.S. Cl. 250—341.1 18 Claims



1. A system for monitoring a structure, comprising:

a printed circuit board mounted at the surface of the structure;

a piece of single crystal silicon mounted on said printed circuit board, said piece of single crystal silicon being in contact with the structure;

an infrared source for directly illuminating said piece of single crystal silicon with radiation having a wavelength in the range of 800–1100 nanometers;

an infrared detector focused on said piece of single crystal silicon for monitoring isochromatic fringe patterns projected from said piece of single crystal silicon as a result of illuminating said piece of single crystal silicon with said radiation, wherein said isochromatic fringe patterns are a direct indication of an amount of stress at the surface of the structure;

at least one sensor coupled to said printed circuit board, each said at least one sensor being capable of collecting data indicative of a physical condition experienced by the structure; and

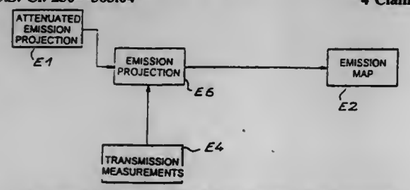
monitoring means in communication with each said at least one sensor for receiving said data.

5,814,817

PROCESS FOR CARRYING OUT EMISSION CARTOGRAPHY OF A BODY CORRECTED WITH RESPECT TO THE ATTENUATION BY SAID BODY

Régis Guillemaud, Gremoble, and Pierre Grangeat, Saint Ismier, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed May 3, 1996, Ser. No. 642,432
Claims priority, application France, May 4, 1995, 95 05342
Int. Cl.[6] G01T *1/161*
U.S. Cl. 250—363.04 4 Claims



1. A process for carrying out a cartography of the emission of radiation by a body corrected with respect to the attenuation of radiation by said body, in which a radiation transmission source is capable of assuming different positions with respect to said body, by carrying out an acquisition of a reference transmission measurement No which would exist in the absence of said body, the transmission source emitting photons toward said body, the process comprising;

determining for each position of the radiation source a transmission measurement N of photons emitted by the radiation source and transmitted by said body;

determining an emission measurement projection of the photons emitted by said body, said emission measurement projection being determined with the same geometry of said body used in the transmission measurement;

obtaining for each position of the radiation source, an attentuation correction coefficient C of the radiation due to a presence of said body by the equation

$$C=\sqrt{\frac{No}{N}}$$

where

N is the transmission measurement;

No is the reference transmission measurement; and

C is the attenuation correction coefficient;

correcting the emission measurement projection for the attenuation by use of another equation

$$Ec=Em\times C$$

where

Em equals the emission measurement projection as measured;

Ec is the attenuation corrected emission measurement projection and

C is the attenuation correction coefficient; and

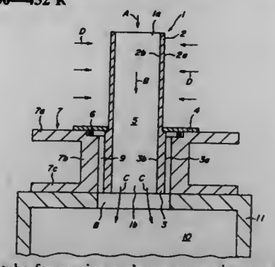
constructing an emissions map on the basis of the attenuation corrected emission measurement projection.

5,814,818

GAS TUBE FOR PASSING PLASMA GENERATING GASES

Toshio Ohashi, Komaki, and Michio Asai, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 5, 1997, Ser. No. 869,920
Claims priority, application Japan, Jun. 11, 1996, 8-149232
Int. Cl.[6] G01N *21/17*
U.S. Cl. 250—432 R 6 Claims



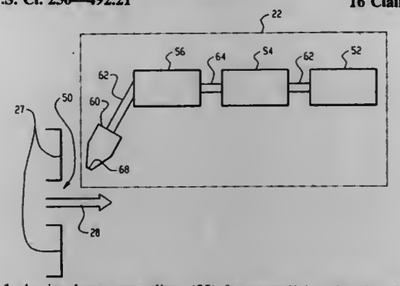
1. A gas tube for passing a plasma generating gas therethrough and irradiating said gas with UV rays, during running in the tube, which tube comprises a longitudinally extended through-hole and a thin circumferential wall formed of a light-pervious alumina ceramic having a center-line mean roughness (R_a) of not more than 1.0 μm at a portion thereof to be exposed to gas plasma, and is provided with a means for radiating UV rays directed towards an upstream portion of the tube, from outside of the tube.

5,814,819

SYSTEM AND METHOD FOR NEUTRALIZING AN ION BEAM USING WATER VAPOR

Frank Sinclair, Quincy; Victor Benveniste, Gloucester, and Jiong Chen, Beverly, all of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 11, 1997, Ser. No. 891,688
Int. Cl.[6] H01J *27/02*
U.S. Cl. 250—492.21 16 Claims



1. An ion beam neutralizer (**22**) for neutralizing the electrical charge of an ion beam (**28**) output from an extraction aperture (**50**) of an ion source (**12**), comprising:

a source of water (**52**);

a vaporizer (**54**) connected to said source of water (**52**) for converting water from said source of water (**52**) from a liquid state to a vapor state;

a mass flow controller (**56**) connected to said vaporizer (**54**) and having an inlet (**64**) and an outlet (**66**), said mass controller operating to meter the volume of water vapor output by said outlet (**66**); and

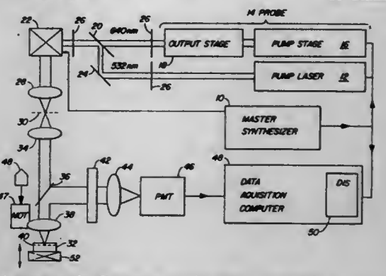
an injection port (**68**) connected to said mass flow controller outlet (**66**) for receiving the metered cutput of said outlet, said injection port located proximate said ion beam extraction aperture (**50**), such that said ion beam and said water vapor interact to neutralize the ion beam.

5,814,820

PUMP PROBE CROSS CORRELATION FLUORESCENCE FREQUENCY DOMAIN MICROSCOPE AND MICROSCOPY

Chen-Yuan Dong; Enrico Gratton, and Peter So, all of Urbana, Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Feb. 9, 1996, Ser. No. 599,256
Int. Cl.[6] G01N *21/64*
U.S. Cl. 250—458.1 18 Claims



1. A pump-probe fluorescence microscope comprising:

a first amplitude modulated laser modulating at a first amplitude modulation frequency;

a second amplitude modulated laser modulating at a second amplitude modulation frequency;

optical transmission means for combining light output from the first and second amplitude modulated lasers, and for focusing combined light output from the first and second lasers upon a common set of molecules in a sample to stimulate fluorescence emissions from said common set of molecules;

optical collection means for collecting a fluorescence signal emitted from the common set of molecules in response to the focusing of combined light output from the first and second amplitude modulated lasers;

a filter for isolating a cross-correlation signal within said fluorescence signal, said cross-correlation signal having an amplitude modulation frequency approximately equal to the difference between said first and second frequencies; and

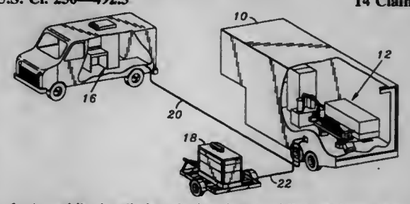
signal processing means for obtaining an image based upon said cross-correlation signal.

5,814,821

MOBILE IRRADIATION DEVICE

Michael Foster Reusch, Princeton Junction, N.J.; Ian Russell Clarkson, Huntington, N.Y., and Alan Murray Melville Todd, Princeton Junction, N.J., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 26, 1996, Ser. No. 756,427
Int. Cl.[6] H01J *33/00*
U.S. Cl. 250—492.3 14 Claims



1. A mobile irradiation device for providing at least one of energetic electrons and short wavelength photons, said mobile irradiation device comprising:

a) a trailer on which is mounted:

i) a photocathode,

ii) a laser for illuminating the photocathode,

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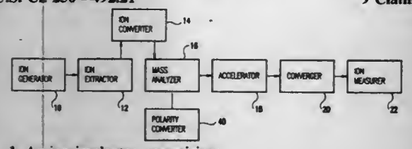
iii) a radio-frequency electron gun for accelerating electrons emitted from the laser illuminated photocathode, and
iv) beamline and spot forming optical elements;
b) control equipment for controlling items mounted upon the trailer; and
c) a portable power supply.

5,814,822
ION IMPLANTER AND ION IMPLANTING METHOD USING THE SAME

Sang-geun Oh, Suwon; Sang-young Moon, Ansan; Jeong-gon Kim, and Do-hyeong Kim, both of Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 771,772
Claims priority, application Rep. of Korea, Dec. 22, 1995, 1995-54714
Int. Cl.[6] H01J *49/42*
U.S. Cl. 250—492.21 **9 Claims**

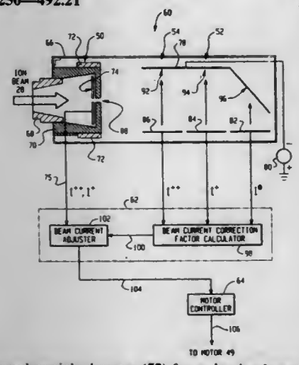


1. An ion implanter, comprising:
an ion extractor;
a mass analyzer for deflecting ions, having one of a positive or negative charged state, in a predetermined direction regardless of the charged state of said ions, said ions being introduced to said mass analyzer from said ion extractor; and
a polarity converter for selectively changing a flux direction of a magnetic field in said mass analyzer, said flux direction being changed according to the charged state of said ions.

5,814,823
SYSTEM AND METHOD FOR SETECING NEUTRAL PARTICLES IN AN ION BEAN

Victor M. Benveniste, Gloucester, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 12, 1997, Ser. No. 900,379
Int. Cl.[6] H01J *39/00*
U.S. Cl. 250—492.21 **20 Claims**

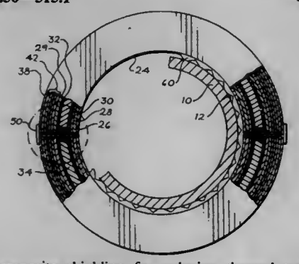


1. A neutral particle detector (52) for an ion implantation system (10) for detecting the neutral particle content of an ion beam (28) comprised primarily of neutral particles and positively charged ions, said neutral particle detector (52) comprising:
a deflector plate (78) residing at a negative electrical potential;
a first collecting electrode (82) residing at a positive electrical potential with respect to said deflector plate (78) for collecting secondary electrons emitted by said deflector plate (78) as a result of neutral particles in the ion beam impacting said deflector plate (78); and
a second collecting electrode (84) residing at a positive electrical potential with respect to said deflector plate (78) for collecting secondary electrons emitted by said deflector plate (78) as a result of positively charged ions in the ion beam impacting said deflector plate (78), said deflector plate and said collecting electrodes (82, 84) separated by a distance through which the ion beam passes.

5,814,824
COMPOSITE THERMAL INSULATION AND RADIOACTIVE RADIATION SHIELDING

Peter N. Hamby, Lansing; Frank P. Polak, Joliet; David E. Olson, LaGrange Park; Edward J. Wolbert, Lisle, all of Ill.; Bruce J. Alpha, Valparaiso, Ind., and Bryan L. Risley, Streator, Ill., assignors to Commonwealth Edison Company, Chicago, Ill.; Electric Power Research Institute, Inc., Palo Alto, Calif.; Sargent & Lundy, LLC, and Transco Products, Inc., both of Chicago, Ill.

Continuation of Ser. No. 559,470, Nov. 15, 1995, abandoned. This application Aug. 22, 1996, Ser. No. 701,388
Int. Cl.[6] G21C *11/00*
U.S. Cl. 250—515.1 **44 Claims**



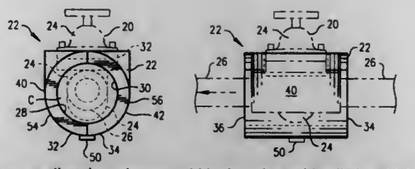
1. A composite shielding for reducing thermal transfer and radioactive radiations emanating from a system, said shielding comprising:
at least one first supporting layer and at least one second supporting layer;
a shielding layer comprising a shield material that reduces said radioactive radiation, wherein said shielding layer is located between at least one first supporting layer and at least one second supporting layer;
at least one inner layer and at least one outer layer such that said first and second supporting layers are located between said inner and outer layers;
at least one first thermal insulation layer located between said inner layer and said shielding layer comprising a low thermal conductivity material a microporous mineral fiber-based material;
a plurality of second thermal insulation layers located between said shielding layer and said outer layer comprising a metallic reflective material, and
said shielding being adapted for installation next to said system.

5,814,825
RADIATION SHIELDS FOR VALVES

Robert L. Mussman, P.O. Box 2805, Bremerton, Wash. 98310

Filed Jan. 22, 1997, Ser. No. 787,548
Int. Cl.[6] G21F *3/02*
U.S. Cl. 250—515.1 **16 Claims**

1. A radiation shield for installation about at least a portion of a valve in a pipe line for shielding against ionizing radiation emitted

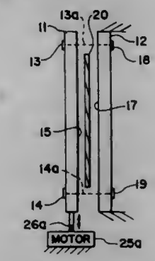


from a radioactive substance within the valve, said radiation shield effectively reduces radiation dosage resulting from said ionizing radiation emitted from within said valve, said radiation shield comprising:
(a) a first separable portion;
(b) a second separable portion;
(c) said first separable portion and said second separable portion each comprising an effective radiation attenuation substance in a thickness for effective attenuation of said ionizing radiation, said first and said second separable portions each of complimentary size and shape for being releasably joined as a matching pair in a closed, shielding position to form a shell having a partially closed internal chamber therebetween, said internal chamber having an internal wall, said internal wall shaped for complementary close fitting engagement with said portion of said valve and a portion of said pipe; and
(d) so that said effective radiation attenuation substance attenuates said ionizing radiation emanating from within said valve at least partially enclosed by said radiation shield.

5,814,826
METHOD AND APPARATUS FOR ALIGNING PHOTOPRINTING PLATES IN A PRODUCTION LINE

Roland Thoms, Freiburg; Gunter Kettner, Neubrandenburg; Dietmar Schuldt, Neubrandenburg, and Lutz Hamann, Neubrandenburg, all of Germany, assignors to Demminer Maschinen Technik GmbH, Germany

Filed Aug. 26, 1996, Ser. No. 702,963
Int. Cl.[6] G01B *11/00*
U.S. Cl. 250—548 **7 Claims**

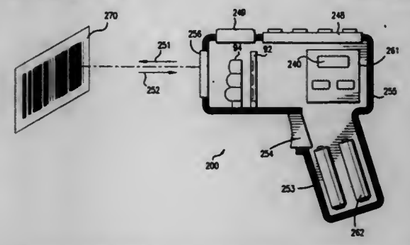


1. A system for positioning a set of photoprinting plates in register with each other comprising:
a first photoprinting plate;
a first laser emitting diode located on a first side of said first photoprinting plate;
a second laser emitting diode located on the first side of said first photoprinting plate and spaced from said first laser emitting diode;
a metal web having a light sensitive coating located proximate a second side of said first photoprinting plate;
a second photoprinting plate, said second photoprinting plate having a first side and a second side, said second photoprinting plate spaced laterally from said first photoprinting plate with said first photoprinting plate postionable with respect to said second photoprinting plate, said second photoprinting plate having a first side proximate said metal web;
a first photo diode located on said second side of said second photoprinting plate, for providing a first output signal as a function of the point of excitement of the first photo diode by said first laser emitting diode;
a second photo diode located on said second side of said second photoprinting plate, for providing a second output signal as a function of the point of excitement of the second photo diode by said second laser emitting diode;
a comparator for determining the position of the first photo printing plate with respect to the second photoprinting plate by comparing each of the output signals to a reference signal and then sending a control signal to reposition the first photoprinting plate with respect to the second photoprinting plate until the first photoprinting plate and the second photoprinting plate are in proper register with each other.

5,814,827
OPTICAL SCANNER WITH EXTENDED DEPTH OF FOCUS

Joseph Katz, Stony Brook, N.Y., assignor to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation-in-part of Ser. No. 445,228, May 19, 1995, Pat. No. 5,627,366. This application May 5, 1997, Ser. No. 850,967
Int. Cl.[6] G06K *5/00*
U.S. Cl. 250—556 **11 Claims**



1. A bar code reading device with an extended depth of focus for reading complete lines of bar code information by optically scanning light reflected from a bar code symbol having bars and spaces of different light reflectivity, said bar code reading device comprising:
(a) a plurality of integrated circuits, each of said circuits comprising an addressable solid-state-imaging detector, each of said detectors comprising an array of individual photosensors arranged so as to receive light reflected from the entirety of said bar code symbol without requiring any movement of the bar code reading device as a whole relative to the bar code symbol;
(b) a plurality of lenses, each of said lenses having a focal length different from each other, each of said lenses associated with and focused on a corresponding one of said detectors so as to provide a plurality of lens/detector pairs, wherein each of said lens-detector pairs provides an optical axis different from and substantially parallel with each other;
(c) a processor for selecting the lens/detector pair that provides a desired optical property when said bar code symbol is placed in a field of view of at least one of said lens/detector pairs.

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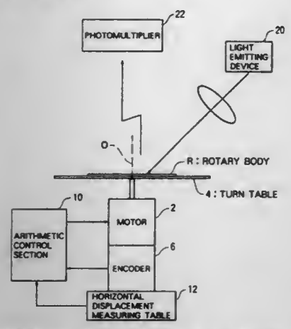
5,814,828

APPARATUS FOR DEFINING THE LOCATION OF A FOREIGN OBJECT ON A ROTARY BODY IN TERMS OF A COORDINATE SYSTEM

Hisashi Isozaki, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Oct. 5, 1995, Ser. No. 538,821
Claims priority, application Japan, Oct. 7, 1994, 6-244260
Int. Cl.[6] G01N *21/88*
U.S. Cl. 250—559.41 **2 Claims**



1. An apparatus for defining a location of a foreign object on a rotary body in terms of a coordinate system, the rotary body adapted to rotate around a horizontally-movable vertical axis of rotation, the apparatus comprising:

a) horizontal displacement detecting means for detecting a horizontal displacement of the vertical axis and for transmitting a first signal representing the horizontal displacement;

b) angular position detecting means for detecting an angular position of the rotary body and for providing a second signal representing the angular position;

c) lighting optical means for illuminating the rotary body's surface;

d) light receiving means for receiving light that is reflected by the rotary body's surface and for producing a third signal representing reflected light;

e) clock signal generating means for generating a clock signal;

f) representative value determining means, responsive to the second signal representing the angular position, for determining that a maximum value of the third signal corresponds to a representative value of angular position;

g) position determining means for determining a position corresponding to the representative value, based on:

1) the first signal representing the horizontal displacement;

2) the second signal representing the angular position; and

3) the clock signal;

wherein the position determining means starts counting clock signals each time a new angular sector is detected by the angular position detecting means; and

h) foreign object detecting means for determining that a representative value exceeding a predetermined level corresponds to the foreign object.

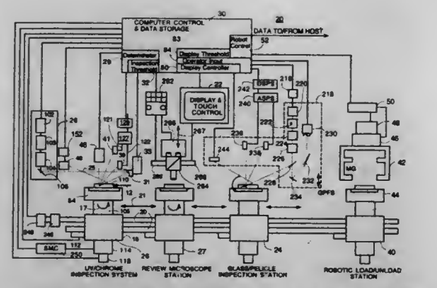
5,814,829

MULTISTATION SURFACE INSPECTION SYSTEM

Sergey V. Broude, Newton Centre; Nicholas Allen, Bedford; Abdu Boudour, West Newton; Eric Chase, Carlisle; Carl Johnson, Tewksbury; Pascal Miller, North Chelmsford, and Jay Ormsby, Salem, all of Mass., assignors to QC Optics, Inc., Wilmington, Mass.

Filed Jul. 11, 1995, Ser. No. 500,768
Int. Cl.[6] G01N *21/88*
U.S. Cl. 250—559.46 **18 Claims**

1. A surface inspection system comprising:



a plurality of inspection stations in which a first said station has a first sensitivity and a first inspection time and a second said station has a second sensitivity and a second inspection time, the second sensitivity being greater than the first sensitivity, the second inspection time being longer than the first inspection time;

means for translating a surface to be inspected to each station;

means for storing at least one inspection threshold value;

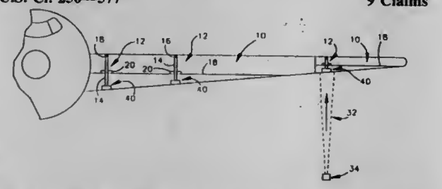
means for determining if said inspection threshold value has been exceeded and in response for outputting an inspection interrupt signal which stops the inspection.

5,814,830

LIQUID GAUGING APPARATUS WITH A MAGNETORESISTIVE SENSOR AND REMOTE SENSOR INTERROGRATION

David Henry Crowne, Middlebury, N.Y., assignor to Simmonds Precision Products, Inc., Akron, Ohio

Division of Ser. No. 325,003, Oct. 18, 1994, Pat. No. 5,530,258. This application Jun. 1, 1995, Ser. No. 457,085
Int. Cl.[6] G01N *15/06*
U.S. Cl. 250—577 **9 Claims**



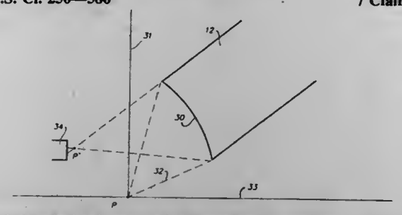
1. A sensor for detecting liquid level comprising an elongate body disposable in the liquid, a float adapted to slide along said body in relation to level of the liquid, said float comprising first magnetic means for actuating a second magnetic means inside said body for producing a sensor output related to the liquid level; said second magnetic means comprises 'a magnetoresistive sensor means having a sensor resistance connected to two sensor terminals wherein said sensor resistance between said terminals varies in relation to position of said float; and encoder means coupled to said terminals for detecting said sensor resistance and converting said detected sensor resistance into an output that is characterized by a series of pulses having a timing relationship between said pulses, with said timing relationship corresponding to the liquid level.

5,814,831

RADIATION READ OUT APPARATUS

Gentil Verbeke, Edegem, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Dec. 27, 1996, Ser. No. 773,188
Claims priority, application European Pat. Off., Jan. 16, 1996, 96200104
Int. Cl.[6] G03B *42/02*
U.S. Cl. 250—586 **7 Claims**



1. A radiation image read out apparatus, comprising:

a system for line-wise scanning a photostimulable phosphor screen carrying a radiation image by means of stimulating rays;

a photo-electric transducer for converting light emitted by said phosphor screen, upon stimulation thereof by said stimulating rays, into an electric signal representation; and

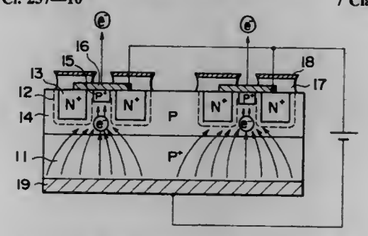
a light guide member for guiding said emitted light to said photo-electric transducer, said light guide member having a light input end and a light output end, said light input end being positioned in the vicinity of a line of said screen that is scanned by said stimulating rays and having a cross section in a plane perpendicular to a scanned line and perpendicular to said screen that is substantially elliptical, said light guide member being arranged so that one focus of the ellipse defining said elliptical cross section is positioned to coincide with the line that is scanned and the second focus of the ellipse defining said elliptical cross section is positioned above the photostimulable phosphor screen.

5,814,832

ELECTRON EMITTING SEMICONDUCTOR DEVICE

Toshihiko Takeda, Tokyo; Takeo Tsukamoto; Nobuo Watanabe, both of Atsugi, and Masahiko Okunuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 259,130, Jun. 13, 1994, abandoned, which is a continuation of Ser. No. 920,164, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 578,211, Sep. 6, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 478,656
Claims priority, application Japan, Sep. 7, 1989, 1-233943; Sep. 7, 1989, 1-233945; Aug. 22, 1990, 2-221713
Int. Cl.[6] H01L *29/06;29/04;29/47*
U.S. Cl. 257—10 **7 Claims**



1. An electron emitting semiconductor device comprising:

a P-type semiconductor layer formed on a semiconductor substrate;

a Schottky barrier electrode formed on said P-type semiconductor layer;

a plurality of point-shaped P^+ area units positioned under and facing said Schottky barrier electrode; and

an N^+ type area in the vicinity of said P^+ area units,

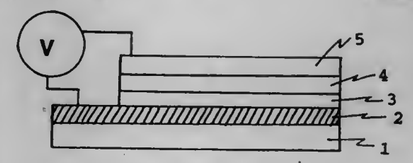
wherein said P+ area units limit points of electron emission.

5,814,833

CONJUGATED POLYMER EXCIPLEXES AND APPLICATIONS THEREOF

Samson A. Jenekhe, Fairport, N.Y., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Division of Ser. No. 187,278, Jan. 26, 1994, Pat. No. 5,597,890, which is a continuation-in-part of Ser. No. 146,266, Nov. 1, 1993, Pat. No. 5,599,899. This application Jul. 1, 1996, Ser. No. 674,390
Int. Cl.[6] H01L *35/24*
U.S. Cl. 257—40 **36 Claims**



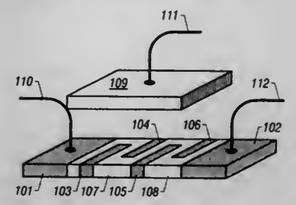
1. An assembly comprising a π-conjugated polymer and an electron donor or acceptor component different from said π-conjugated polymer and effective to form an exciplex with said π-conjugated polymer when at least one of said π-conjugated polymer or said electron donor or acceptor component is in an excited stated, said π-conjugated polymer and said electron donor or acceptor component having a contact relationship in said assembly sufficient to permit said exciplex to form.

5,814,834

THIN FILM SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo; Jun Koyama, and Yasuhiko Takemura, both of Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Kanagawa-ken, Japan

Filed Dec. 4, 1996, Ser. No. 759,565
Claims priority, application Japan, Dec. 4, 1995, 7-344496; Mar. 8, 1996, 8-081014; Mar. 11, 1996, 8-083150
Int. Cl.[6] H01L *31/036;29/04;27/01*
U.S. Cl. 257—59 **29 Claims**



1. A thin film semiconductor device including at least a thin film semiconductor, a gate insulating film, and a gate electrode, comprises:

a semiconductor island-like shape which has an outer perimeter including a first outer edge and a second outer edge;

a source region having a first conductivity type to which a source electrode/wiring is connected;

a drain region having said first conductivity type to which a drain electrode/wiring is connected;

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a base region being intrinsic or having a conductivity type opposite to said first conductivity type and disposed between said source region and said drain region;

a first floating island region having said first conductivity type and surrounded by said base region and said first outer edge; and

a second floating island region having said first conductivity type and surrounded by said base region and said second outer edge; wherein:

said gate electrode is provided above or under said base region through said gate insulating film; and

each of said first and second outer edges being defined by a line or a curve connecting said source region to said drain region.

5,814,835

SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE SAME

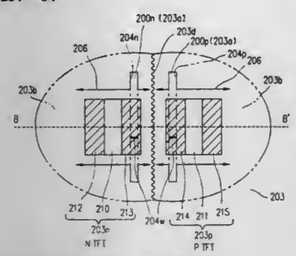
Naoki Makita, Nara; Tadayoshi Miyamoto; Tsukasa Shibuya, both of Tenri, all of Japan, and Masashi Maekawa, Vancouver, Canada, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1995, Ser. No. 558,501

Claims priority, application Japan, Nov. 22, 1994, 6-288135

Int. Cl.[6] H01L *29/04*

U.S. Cl. 257—64 **9 Claims**



1. A semiconductor device comprising:

a substrate having an insulating surface; and

an element region formed by crystallizing an amorphous silicon film, the element region being provided on the insulating surface of the substrate,

wherein the element region is constituted by a laterally crystallized region formed by crystallizing the amorphous silicon film from a linearly crystallized region crystallized by a selective introduction of catalyst elements for promoting a crystallization of the amorphous silicon film to a region surrounding the linearly crystallized region by performing a heat-treatment,

and wherein a concentration of the catalyst elements in at least one of the laterally crystallized region and the linearly crystallized region is controlled by a line width of an introduction setting region having a linear planar pattern, the line width being set so as to selectively introduce the catalyst elements.

5,814,836

SEMICONDUCTOR DEVICE REQUIRING FEWER MASKING STEPS TO MANUFACTURE

Lyu Ki Hyun, Lyojin, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Feb. 3, 1997, Ser. No. 792,377

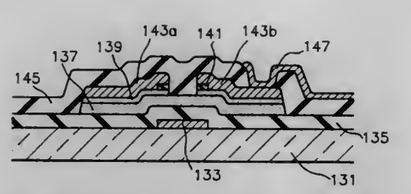
Claims priority, application Rep. of Korea, Apr. 9, 1996, P96-10638

Int. Cl.[6] H01L *27/15;31/12*

U.S. Cl. 257—72 **12 Claims**

1. A semiconductor device, comprising:

a substrate;



a gate electrode formed on a first portion of said substrate;

a first semiconductor layer overlying said gate electrode and a second portion of said substrate adjacent said first portion;

first and second spaced doped semiconductor layers provided on a surface of said first semiconductor layer and defining an exposed portion of said first semiconductor layer;

first and second insulating layer respectively provided on said first and second spaced doped semiconductor layers adjacent a periphery of said exposed portion of said first semiconductor layer;

a first electrode overlying and in contact with said doped semiconductor layer and said first insulating layer; and

a second electrode overlying and in contact with said second doped semiconductor layer and said second insulating layer.

5,814,837

COMPACT LIGHT-EMITTING DEVICE WITH SEALING MEMBER

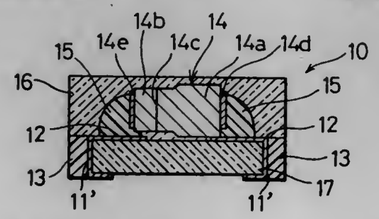
Jun Okazaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 566,134, Dec. 1, 1995, Pat. No. 5,670,797. This application May 28, 1997, Ser. No. 864,680

Claims priority, application Japan, Dec. 6, 1994, 6-302329; Jun. 8, 1995, 7-142202

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—91 **20 Claims**



1. A light-emitting device comprising:

an insulating substrate through which at least a pair of adjacent through holes are formed, the through holes penetrating through the insulating substrate from a top surface of the substrate to a bottom surface of the substrate;

a light-emitting diode chip having a p-side semiconductor layer and an n-side semiconductor layer that are joined into a p-n junction, the light emitting diode chip being placed between each pair of said adjacent through holes;

a first electrode formed in one of the adjacent through holes, and connected to the p-side semiconductor layer to form an electrical connection on a bottom surface of the insulating substrate;

a second electrode formed in the other of the adjacent through holes in a separate manner from the first electrode, and connected to the n-side semiconductor layer to form another electrical connection on the bottom surface of the insulating substrate;

a sealing member for sealing openings of the through holes; and

a light-transmitting resin for sealing each light-emitting diode chips wherein said sealing member prevents the light-transmitting resin from entering into the through holes.

5,814,838

LIGHT EMITTING SEMICONDUCTOR ELEMENT WITH ZN DOPING

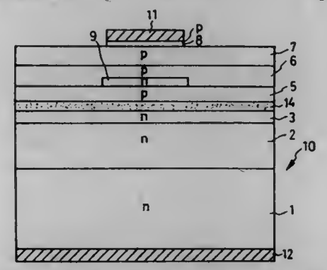
Koji Ohtsuka, Kawagoe; Hitoshi Murofushi, Sagamihara; Emiko Chino, Kawagoe, and Tetsuji Moku, Asaka, all of Japan, assignors to Sanken Electric Co., Ltd., Saitama-ken, Japan

Filed May 15, 1997, Ser. No. 856,946

Claims priority, application Japan, May 22, 1996, 8-151537; Apr. 4, 1997, 9-102463

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—94 **5 Claims**



1. A light emitting semiconductor element having a semiconductor body having a plurality of laminated semiconductor layers for emitting light, a cathode on one face of the semiconductor body, and an anode on another face of the semiconductor body, wherein the improvement resides in the semiconductor body comprising:

(a) an active layer of AlGaInP semiconductor material additionally containing Zn at a concentration of 1×10^{16}–5×10^{17} cm^{-3}, the active layer being 0.5–2.0 micrometers thick;

(b) an n type cladding layer of either n type AlGaInP or n type AlInP semiconductor material on one side of the active layer; and

(c) a p type cladding layer of p type AlGaInP or p type AlInP semiconductor material on another side of the active layer.

5,814,839

SEMICONDUCTOR LIGHT-EMITTING DEVICE HAVING A CURRENT ADJUSTING LAYER AND A UNEVEN SHAPE LIGHT EMITTING REGION, AND METHOD FOR PRODUCING SAME

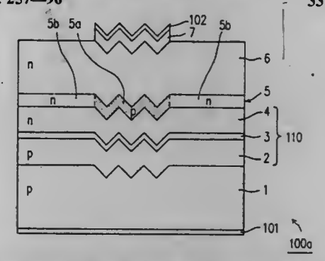
Hiroyuki Hosoba, Soraku-gun, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1996, Ser. No. 600,008

Claims priority, application Japan, Feb. 16, 1995, 7-028420; Feb. 24, 1995, 7-037377

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—96 **33 Claims**



1. A semiconductor light-emitting device comprising:

a semiconductor substrate of first conductivity type having a top surface end a bottom surface;

a current path adjusting layer including a current blocking region and a current passing region, containing a first dopant of the first conductivity type and a second dopant of a second conductivity type;

a multi-layer structure formed between the top surface of the semiconductor substrate and the current path adjusting layer, the multi-layer structure including an active layer for emitting light and a pair of cladding layers sandwiching the active layer;

a first electrode formed on the bottom surface of the semiconductor substrate; and

a second electrode formed over the current blocking region of the current path adjusting layer,

wherein the top surface of semiconductor substrate has a flat region and a groove-formed region in which at least one groove is formed and conductivity of the current path adjusting layer is locally changed depending upon a crystal orientation of a slope of the groove and a crystal orientation of the flat region of the top surface of the semiconductor substrate, and

the current blocking region above the groove-formed region has the first conductivity and the current passing region above the first region has the second conductivity.

5,814,840

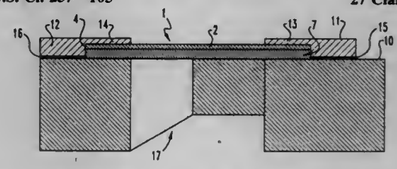
INCANDESCENT LIGHT ENERGY CONVERSION WITH REDUCED INFRARED EMISSION

Jerry MacPherson Woodall; Kevin Tyrone Kornegay, both of West Lafayette, Ind., and Michael Gregg Spencer, Washington, D.C., assignors to Purdue Research Foundation, West Lafayette, Ind., and Howard University, Washington D.C.

Filed Jun. 6, 1995, Ser. No. 469,675

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—103 **27 Claims**



1. Apparatus for the conversion of energy between at least one of heat and electricity and incandescent light comprising in combination:

a semiconductor energy converter body member having a semiconductor body, with at least one radiant energy transfer surface and at least a first region for the transfer of at least one of heat and electricity, said first region including at least a first end and a second end, said first region extending between said first end and said second end,

said semiconductor energy converter body member having a band gap greater than about 2 eV,

said semiconductor energy converter body having at least a second layer adjacent to and essentially parallel with said first region in which the free carrier absorption property of said semiconductor is suppressed, said second layer including at least a first end and a second end adjacent said first end and said second end of said first layer, respectively, said second layer separated from said first region by an interface, and,

means transferring at least one of heat and electricity at least to said first region, wherein said means transferring at least one of heat and electricity includes at least one of: (1) electrical contacts in contact with both said first end and said second end of said first region, for current to pass therebetween, (2) electrical contacts in contact with both said first end and said second end of said second layer, for current to pass therebetween and (3) an external heating source for heating said semiconductor body to cause incandescent light to be emitted by said radiant energy transfer surface.

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5,814,841

SELF-SCANNING LIGHT-EMITTING ARRAY

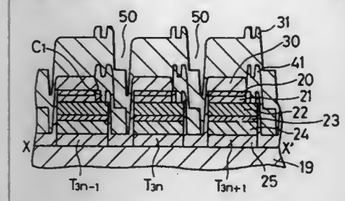
Yukihisa Kusuda, Kukizaki-machi; Kiyoshi Tone, Tsukuba; Ken Yamashita, Tokoyo, and Shuhei Tanaka, Tsukuba, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 324,197, Mar. 16, 1989, abandoned, and Ser. No. 860,203, Mar. 26, 1992, abandoned, and Ser. No. 84,766, Jun. 28, 1993, Pat. No. 5,451,977. This application Apr. 21, 1995, Ser. No. 426,060

Claims priority, application Japan, Mar. 18, 1988, 63-65392; Jul. 1, 1988, 63-164353; Sep. 30, 1988, 63-246629; Sep. 30, 1988, 63-246630; Oct. 19, 1988, 63-263402

Int. Cl.[6] H01L *29/74;33/00;31/111*

U.S. Cl. 257—113 **34 Claims**



1. A monolithic light-emitting array comprises:

an array of light-emitting elements having a common substrate and each having a gate and an anode, said light-emitting elements being made of compound semiconductor and including ON state transferring functions;

coupling means for electrically coupling the gate of one of said light-emitting elements to the gate of the next light emitting elements so that the conducting light-emitting element will cause the next light-emitting element to turn on upon applying energy through its anode;

at least two transfer lines each connected to anodes of every at least two light-emitting elements; and

polyphase clock means connected to said transfer lines to provide for transferring a conducting state from one light-emitting element to the next.

5,814,842

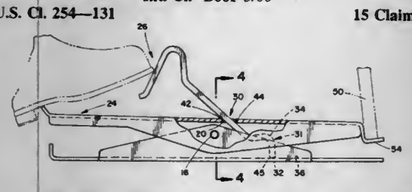
JACKING DEVICE ADAPTED FOR PANEL INSTALLATION

Christopher K. Muldoon, 1696 Sheridan Rd., South Euclid, Ohio 44121; Daniel H. Dieckman, 2666 Stiegler Rd., Valley City, Ohio 44280, and John V. Pastva, 10839 Holliston La., Parma Heights, Ohio 44130

Filed Oct. 7, 1994, Ser. No. 320,174

Int. Cl.[6] B66F *3/00*

U.S. Cl. 254—131 **15 Claims**



1. A lift tool to position and support a work item vertically during installation while fastening devices are put in place, comprising:

a base member, a pivoting lever member supported by a pivot in said base member and a locking device means for locking the lever member at a selected position relative to the base member;

wherein the lever member includes a pedal portion sized to receive a workboot of a worker and the locking device means includes a wedge received through a wedge aperture in the lever member configured to obtain a lock of the wedge relative to the lever member in cooperation with the base member and lever member when bias by the workboot on the pedal portion raises the lever member, adjusts the position of the wedge relative thereto and locks the lever member at the selected position relative to the base member.

5,814,843

HETEROJUNCTION BIPOLAR TRANSISTOR HAVING A GRADED-COMPOSITION BASE REGION

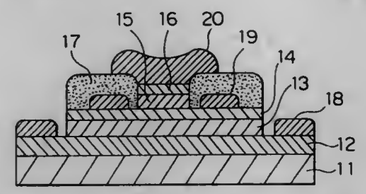
Michio Ohkubo, Kanagawa, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1995, Ser. No. 566,188

Claims priority, application Japan, Dec. 1, 1994, 6-298422

Int. Cl.[6] H01L *29/737;29/205*

U.S. Cl. 257—197 **8 Claims**



1. A heterojunction bipolar transistor comprising a GaAs substrate and a GaAs collector layer, a base layer and an emitter layer consecutively grown on said GaAs substrate, at least a portion of said base layer being doped with carbon, said base layer being composed of graded-composition compound $GaAs_{1-x}P_x$, given X changing as viewed in the direction along the thickness of said base layer,

wherein x has a maximum not higher than about 0.20.

5,814,844

GATE ARRAY HAVING HIGHLY FLEXIBLE INTERCONNECTION STRUCTURE

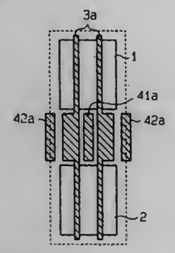
Takashi Nagata, Oobu; Hiroshi Uesugi, Nagoya, and Hiroaki Tanaka, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 27, 1996, Ser. No. 721,448

Claims priority, application Japan, Sep. 28, 1995, 7-251611

Int. Cl.[6] H01L *27/10*

U.S. Cl. 257—206 **20 Claims**



1. A gate array comprising:

a plurality of basic cells each including

a first element region of a first conductivity type, said first element region having a plurality of transistors connected in series to each other and formed on a subtrate,

a second element region of a second conductivity type, said second element region having a plurality of transistors connected in series to each other and formed on said substrate, said first and second element regions being arranged opposed to each other, and

a plurality of gate electrodes commonly provided for said first and second element regions, a number of said gate electrodes corresponding to a number of said transistors; wherein

a number of said transistors in said second element region corresponds to a number of said transistors in said first element region;

as many gate electrodes as said transistors in said first or second element region are commonly provided for said first and second element regions; and

said basic cells further comprise

first auxiliary wires respectively provided between said gate electrodes between said first and second element regions, wherein said first auxiliary wires are formed on a plane of said gate electrodes and formed so that said first auxiliary wires are separated from said first and second element regions and said gate electrodes in a plane, and

second auxiliary wires provided between said basic cells between said first and second element regions, wherein said second auxiliary wires are formed on the plane of said gate electrodes and formed so that said second auxiliary wires are separated from said first and second element regions and said gate electrodes in a plane.

5,814,845

FOUR RAIL CIRCUIT ARCHITECTURE FOR ULTRA-LOW POWER AND VOLTAGE CMOS CIRCUIT DESIGN

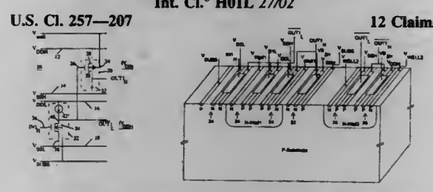
L. Richard Carley, Pittsburgh, Pa., assignor to Carnegie Mellon University, Pittsburgh, Pa.

PCT No. PCT/US95/00295, § 371 Date Jul. 10, 1996, § 102(e) Date Jul. 10, 1996, PCT Pub. No. WO95/19046, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 10, 1995, Ser. No. 669,518

Int. Cl.[6] H01L *27/02*

U.S. Cl. 257—207 **12 Claims**



1. A complementary metal oxide semiconductor circuit comprising:

a first plurality of components for producing a first output signal, at least one of said components having a gate terminal, a source terminal, and a drain terminal;

a first pair of voltage rails including a first voltage rail providing a first voltage and a second voltage rail providing a second voltage to said source terminal and drain terminal of said first plurality of components;

a second plurality of components for producing a second output signal, at least one of said components having a second gate terminal, a second source terminal, and a second drain terminal;

a second pair of voltage rails including a third voltage rail providing a third voltage and a fourth voltage rail providing a fourth voltage to said second source terminal and second drain terminal of said second plurality of components; and

a plurality of conductors interconnecting said first and second pluralities of components to form a first circuit portion wherein current flows between said first voltage rail and second voltage rail and the value of said first output signal is between said first and second voltages, and to form a second circuit portion wherein current flows between said third voltage rail and said fourth voltage rail and the value of said second output signal is between said third and fourth voltages, with substantially no current flow between said first and second pair of voltage rails.

5,814,846

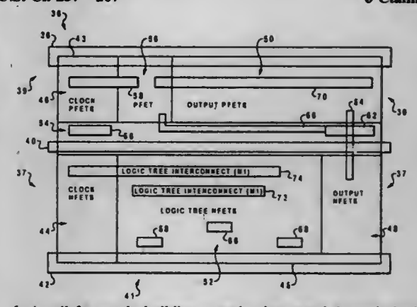
CELL APPARATUS AND METHOD FOR USE IN BUILDING COMPLEX INTEGRATED CIRCUIT DEVICES

Alexander Dankwart Essbaum, and Brian Allan Zoric, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1996, Ser. No. 726,719

Int. Cl.[6] H01L *23/528;27/118;29/41*

U.S. Cl. 257—207 **6 Claims**



1. A cell for use in building complex integrated dynamic logic circuits, comprising:

a plurality of regions, said plurality of regions comprising:

a first region dedicated to a first type of integrated circuit element;

a second region dedicated to a second type of integrated circuit element;

a third region dedicated to one or more of a plurality of diverse types of integrated circuit elements for utilization in multiple diverse applications, wherein said cell may be utilized in conjunction with a plurality of said cells to efficiently form a complex integrated circuit device image;

an upper edge and a lower edge;

a plane dedicated to a ground line, said plane dedicated a ground line located horizontally along the lower edge of said cell;

a plane dedicated to a clock line, said plane dedicated to a clock line extending horizontally along a central region of said cell;

a plane dedicated to a voltage supply line, said plane dedicated to a voltage supply line located horizontally along the upper edge of said cell;

said first region dedicated to a first type of integrated circuit element further comprising a first subregion dedicated to at least one n-type clock transistor, and a second subregion dedicated to at least one n-type output inverter transistor;

said second region dedicated to a second type of integrated circuit element further comprising a first subregion dedicated to at least one p-type clock transistor, a second subregion dedicated to at least one p-type pull-up transistor, and a third subregion dedicated to at least one p-type output inverter transistor; and

said third region dedicated to one or more of a plurality of diverse types of integrated circuit elements for utilization in multiple diverse applications, wherein said third region further comprises areas dedicated to n-type logic tree transistors having input pins and areas dedicated to input pins of said n-type logic tree transistors.

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5,814,847

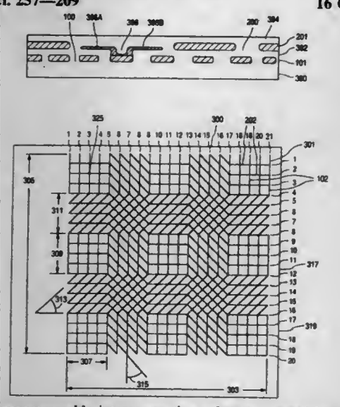
GENERAL PURPOSE ASSEMBLY PROGRAMMABLE MULTI-CHIP PACKAGE SUBSTRATE

Elias E. Shihadeh, Nazareth, Israel, and Peter M. Weiler, Palo Alto, Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Feb. 2, 1996, Ser. No. 595,684

Int. Cl.[6] **H05K** *1/02;* **H01L** *27/02*

U.S. Cl. 257—209 **16 Claims**



1. A programmable interconnection substrate comprising:

a first conductive trace layer formed within said interconnection substrate;

a first insulating layer having a first surface and a second surface opposite said first surface, said second surface of said first insulating layer facing said first conductive trace layer;

a second conductive trace layer formed on said first surface of said first insulating layer;

a plurality of conductive vias, each conductive via being a conductive structure extending from said second conductive trace layer, through said first insulating layer, to said first conductive trace layer, and each said conductive via including at least one conductive via extension extending from said conductive via along said first surface of said insulation layer;

a second insulating layer over said second conductive trace layer;

wherein said first conductive trace layer comprises a first plurality of electrical conductors oriented in a first direction;

said second conductive trace layer comprises a second plurality of electrical conductors oriented in a second direction; and

said first insulating layer is between said first and second conductive trace layers.

5,814,848

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING REDUCED WIRING CAPACITANCE

Shigeo Oshima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 31, 1996, Ser. No. 656,385

Claims priority, application Japan, May 31, 1995, 7-133943

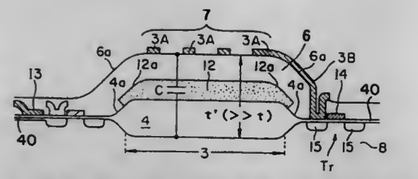
Int. Cl.[6] **H01L** *27/10;29/76;29/94;31/062*

U.S. Cl. 257—210 **8 Claims**

1. A semiconductor integrated circuit comprising:

a semiconductor substrate;

an element separating field oxide film formed in a surface portion of said semiconductor substrate at such a position as to correspond to a bus line region formed between a pair of circuit block regions, said field oxide film formed with first sloping surfaces rising inward beginning from ends thereof;



an oxide film formed in a surface portion of said semiconductor substrate at such positions as to correspond to a pair of the circuit block regions;

an oxide film formed by changing a poly silicon wiring layer formed on said field oxide film, said oxide film formed with second sloping surfaces rising inward beginning from ends thereof;

a wiring layer formed by patterning the poly silicon wiring layer formed on said oxide film;

an interlayer insulating film extending to the circuit block regions and formed with covering sloping surfaces for covering the first and second sloping surfaces, for covering said field oxide film, said oxide film and said poly silicon wiring layer; and

aluminum wires arranged on said interlayer insulating film.

5,814,849

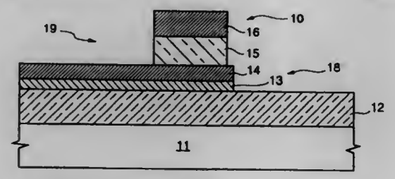
THIN FILMS OF ABO_3 WITH EXCESS B-SITE MODIFIERS AND METHOD OF FABRICATING INTEGRATED CIRCUITS WITH SAME

Masamichi Azuma; Carlos A. Paz De Araujo, and Michael C. Scott, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Matsushita Electronics Corporation, Japan

Division of Ser. No. 270,819, Jul. 5, 1994, Pat. No. 5,624,707, which is a continuation-in-part of Ser. No. 165,082, Dec. 10, 1993, which is a continuation-in-part of Ser. No. 132,744, Oct. 5, 1993, Pat. No. 5,514,822, which is a continuation-in-part of Ser. No. 993,380, Dec. 18, 1992, Pat. No. 5,456,945, and Ser. No. 981,133, Nov. 24, 1992, and Ser. No. 965,190, Oct. 23, 1992, said Ser. No. 981,133 and Ser. No. 965,190, each is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991. This application Jan. 27, 1997, Ser. No. 788,229

Int. Cl.[6] **H01L** *29/76*

U.S. Cl. 257—295 **2 Claims**



1. An integrated circuit comprising:

a substrate,

a thin film of barium strontium titanate formed on said substrate, said thin film including excess B-site material in an amount ranging from 0.01 mol % to 100 mol % more than is required to satisfy a formula ABO_3 wherein A is total A-site material, B is total B-site material, and O is oxygen; and

wiring layers operably configured to include said thin film of barium strontium titanate as a portion of an integrated circuit,

said thin film having a thickness of less than 1600 Å.

5,814,850

SEMICONDUCTOR DEVICE INCLUDING A CAPACITOR RESPONSIBLE FOR A POWER SUPPLY VOLTAGE TO SEMICONDUCTOR DEVICE AND CAPABLE OF BLOCKING AN INCREASED VOLTAGE

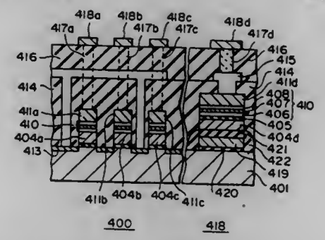
Shoichi Iwasa, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 27, 1996, Ser. No. 671,341

Claims priority, application Japan, Aug. 22, 1995, 7-236121

Int. Cl.[6] **H01L** *27/108;29/76;29/94;31/119*

U.S. Cl. 257—296 **68 Claims**



1. A semiconductor device comprising:

element forming regions in which to form semiconductor elements at a semiconductor substrate;

a patterned isolation region for defining said element forming regions at said semiconductor substrate;

a field shield isolation structure formed in said isolation region for electrically isolating said semiconductor elements formed in said element forming region from one another; and

a filtering capacitor, formed on a part of said isolation structure, for removing noise in a power supply line for the semiconductor device, said filtering capacitor including a lower electrode formed on said field shield isolation structure, an upper electrode, and a dielectric layer formed between said lower electrode and upper electrode and having at least an oxide film and a nitride film, one of said upper and lower electrodes being formed on said dielectric layer for connection with said power supply line.

5,814,851

SEMICONDUCTOR MEMORY DEVICE USING A PLURALITY OF INTERNAL VOLTAGES

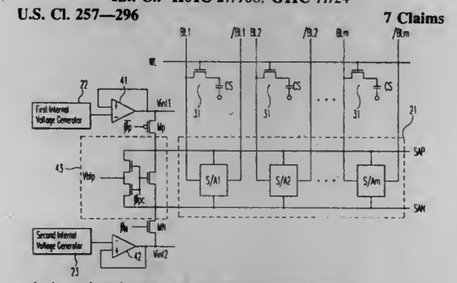
Jung Won Suh, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Ichon, Rep. of Korea

Filed Aug. 16, 1996, Ser. No. 698,937

Claims priority, application Rep. of Korea, Aug. 18, 1995, 1995-25433

Int. Cl.[6] **H01C** *27/108;* **G11C** *11/24*

U.S. Cl. 257—296 **7 Claims**



1. A semiconductor memory device comprising:

a) a plurality of memory cells, each of said plurality of memory cells including:

1) a capacitor for storing data; and

2) transistor means for inputting a ground voltage at its substrate and for selectively connecting said capacitor to a bit line;

b) a plurality of sense amplifier means, connected to corresponding bit lines, for sensing and amplifying data which are transferred from said memory cells to said bit line;

c) first internal voltage supply means for supplying a stable first internal voltage regardless of a voltage bias state of the memory device, wherein said first internal voltage supply means includes:

1) an internal voltage generator means for generating the first internal voltage in response to an external high supply voltage and the ground voltage; and

2) an internal voltage drive means for supplying the first internal voltage from said first internal voltage generator to said sense amplifier means;

d) first switching means for switching the first internal voltage from said first internal voltage supply means to said sense amplifier means;

e) second internal voltage supply means for supplying a stable second internal voltage regardless of the voltage bias state of the memory device, wherein said second internal voltage supply means includes:

1) an internal voltage generator means for generating the second internal voltage in response to an external high supply voltage and the ground voltage; and

2) an internal voltage drive means for supplying the second internal voltage from said second internal voltage generator to said sense amplifier means;

f) second switching means for switching the second internal voltage from said second internal voltage supply means to said sense amplifier means; and

g) a precharge circuit, connected directly between said first switching means and second switching means, and connected between the first internal voltage supply means and the second internal voltage supply means, for precharging said sense amplifier means to a predetermined voltage.

5,814,852

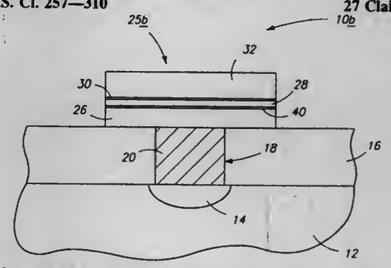
METHOD OF FORMING A TA_2O_5 DIELECTRIC LAYER METHOD OF FORMING A CAPACITOR HAVING A TA_2O_5 DIELECTRIC LAYER, AND CAPACITOR CONSTRUCTION

Gurtej S. Sandhu, and Pierre C. Fazan, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 444,853, May 19, 1995, Pat. No. 5,663,088. This application Jun. 11, 1996, Ser. No. 664,305

Int. Cl.[6] **H01L** *29/62*

U.S. Cl. 257—310 **27 Claims**



1. A capacitor comprising:

a first electrically conductive capacitor plate;

a capacitor dielectric layer adjacent the first electrically conductive capacitor plate, the capacitor dielectric layer comprising Ta_2O_5;

a second electrically conductive capacitor plate, the Ta_2O_5 dielectric layer being positioned between the first and second electrically conductive plates; and

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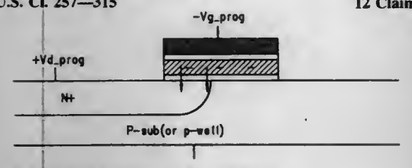
a predominately amorphous diffusion barrier layer adjacent the Ta_2O_5 dielectric layer, the diffusion layer comprising TiC_xN_y, and wherein "x" is in a range of about 0.01 to about 0.05 and "y" is in a range of about 0.99 to about 0.5.

5,814,853

SOURCELESS FLOATING GATE MEMORY DEVICE AND METHOD OF STORING DATA

Jian Chen, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 22, 1996, Ser. No. 589,750
Int. Cl.[6] H01L *29/788*
U.S. Cl. 257—315 **12 Claims**



1. A sourceless memory cell, comprising:

a substrate having a surface;

a drain region formed in the substrate;

a first oxide overlying the drain region on the surface of the substrate;

a first floating gate overlying the oxide;

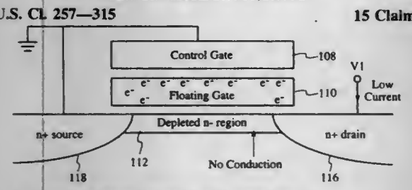
wherein data is stored in the cell by an addition or removal of a charge accumulation on the floating gate, such that upon application of a negative potential applied to the floating gate and a positive potential applied to the drain, a read current between the drain and substrate is induced in proportion to an amount of electrons stored on the gate.

5,814,854

HIGHLY SCALABLE FLASH EEPROM CELL

David K. Y. Liu, 19970 Brenda Ct., Cupertino, Calif. 95014, and Wenchi Ting, 4837 Lago Vista Cir., San Jose, Calif. 95129

Filed Sep. 9, 1996, Ser. No. 711,479
Int. Cl.[6] H01L *29/788;29/792*
U.S. Cl. 257—315 **15 Claims**



1. A semiconductor memory cell comprising:

a continuous n-channel region including a channel region;

a first insulating layer overlying said continuous n-channel region wherein a neutral state of the n-channel region is active;

a floating gate overlying said first insulating layer;

a second insulating layer overlying said floating gate; and

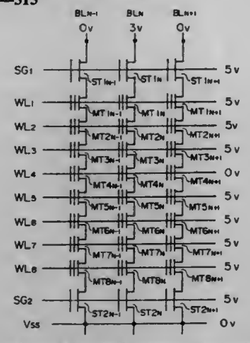
a control gate overlying said second insulating layer.

5,814,855

NONVOLATILE MEMORY DEVICE AND METHOD OF MANUFACTURING SAME

Kenshiro Arase, and Koichi Maari, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 321,911, Oct. 12, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 767,411
Claims priority, application Japan, Oct. 15, 1993, 5-258711; Oct. 22, 1993, 5-264639
Int. Cl.[6] H01L *29/68*
U.S. Cl. 257—315 **5 Claims**



1. A semiconductor nonvolatile memory device having reduced write disturbance, comprising:

(a) a plurality of memory transistors, each memory transistor including;

a silicon substrate;

a tunnel oxide film formed on said silicon substrate;

a source diffusion layer formed on said silicon substrate and forming a source electrode of said memory transistor;

a drain diffusion layer formed on said silicon substrate and forming a drain electrode of said memory transistor;

a floating gate polycrystalline silicon for forming a floating gate electrode and for storing charge and changing a threshold voltage of said memory transistor according to a data, said floating gate polycrystalline silicon is formed on said tunnel oxide film between said source diffusion layer and said drain diffusion layer;

an insulating film formed on said floating gate polycrystalline silicon;

a control gate polycrystalline silicon for forming a control gate electrode of said memory transistor formed on said insulating film;

(b) a plurality of word lines, wherein each said word line is connected to a respectively associated control gate electrode of one of said memory transistors;

(c) a plurality of bit lines, wherein each said bit line is connected to a respectively associated drain electrode of one of said memory transistors;

(d) a plurality of source lines, wherein each said source line is connected to a respectively associated source electrode of one of said memory transistors; and

(e) wherein said plurality of memory transistors are arranged in a matrix of said plurality of word lines and said plurality of bit lines, wherein said memory transistors are connected to the same bit line are arranged in a parallel connection between said same bit line and source line;

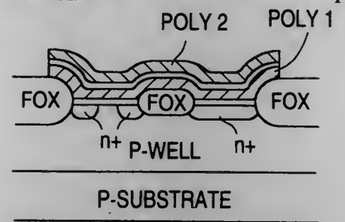
wherein a P-type impurity is introduced in said floating gate polycrystalline layer of each said memory transistor whereby the threshold voltage of said memory transistor with zero charge present in the floating gate is raised by the difference between the work function of N-type floating gate polycrystalline silicon and the work function of P-type floating gate polycrystalline silicon generally on the order of 1 V.

5,814,856

VARIABLE AND TUNABLE V_T MOSFET WITH POLY AND/OR BURIED DIFFUSION

Albert Bergemont, and Min-hwa Chi, both of Palo Alto, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 15, 1997, Ser. No. 857,156
Int. Cl.[6] H01L *29/76*
U.S. Cl. 257—319 **1 Claim**



1. A variable and tuneable threshold voltage MOSFET structure comprising:

first and second spaced-apart oxide isolation regions formed in a semiconductor substrate to define a substrate region therebetween, the semiconductor substrate having a first conductivity type;

a third oxide isolation formed in the substrate region and spaced-apart from both the first oxide isolation region and the second oxide isolation region to define a device active substrate region between the first and third oxide isolation regions and a coupling substrate region between the second and third oxide isolation regions;

first and second spaced-apart source/drain regions having a second conductivity type opposite the first conductivity type formed in the active substrate region to define a channel region therebetween;

a bias gate region having the second conductivity type formed in the coupling substrate region, the bias gate region connected to receive a bias voltage;

first and second oxide layers formed on the active substrate region and the coupling substrate region, respectively;

a conductive floating gate formed on the first and second oxide layers and to extend over the third oxide isolation region; and

a conductive control gate formed over the floating gate and separated from the floating gate by dielectric material, the control gate connected to receive a control voltage.

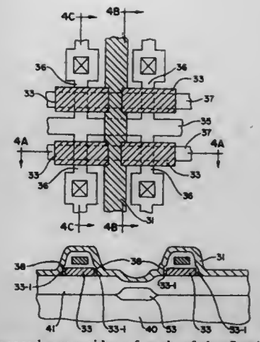
5,814,857

EEPROM FLASH MEMORY CELL, MEMORY DEVICE, AND PROCESS FOR FORMATION THEREOF

KeunHyung Park, Yungdungpo-ku, Rep. of Korea, assignor to Goldstar Electron Company, Ltd., Chungcheongbuk-do, Rep. of Korea

Continuation of Ser. No. 599,470, Jan. 23, 1996, abandoned, which is a division of Ser. No. 330,777, Oct. 28, 1994, Pat. No. 5,643,812. This application Jul. 28, 1997, Ser. No. 901,154
Claims priority, application Rep. of Korea, Oct. 28, 1993, 93-22629
Int. Cl.[6] H01L *29/788*
U.S. Cl. 257—321 **7 Claims**

1. An EEPROM flash memory device comprising: sources and drains arranged in a first direction; a floating gate electrode of a first width disposed between each source and drain, each floating gate electrode being positioned towards a channel upon a gate insulating layer and between a source and a drain; and control gate electrodes of a second width disposed upon the floating gate electrodes and arranged in a second direction, the second direction being perpendicular to the first direction, and a side wall insulating layer of a first thickness disposed upon sides of each of the control gate electrodes, and a tunneling insulating layer of a second



thickness disposed upon sides of each of the floating gate electrodes, wherein an intermediate insulating layer is disposed between each floating gate electrode and each control gate electrode, wherein the first width is greater than the second width, wherein the first thickness is greater than the second thickness, the EEPROM flash memory device further comprising:

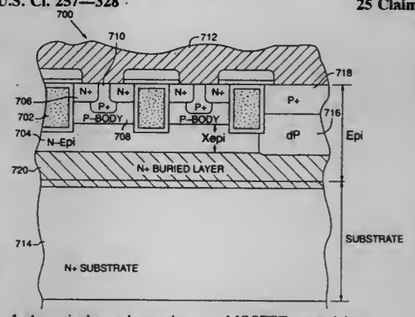
an erasing electrode for coupling with at least one side of each floating gate electrode at one or more points thereof across the tunneling insulating layer, wherein the erasing electrodes are arranged in the first direction.

5,814,858

VERTICAL POWER MOSFET HAVING REDUCED SENSITIVITY TO VARIATIONS IN THICKNESS OF EPITAXIAL LAYER

Richard K. Williams, Cupertino, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.

Filed Mar. 15, 1996, Ser. No. 616,393
Int. Cl.[6] H01L *29/72*
U.S. Cl. 257—328 **25 Claims**



1. A vertical trench-gated power MOSFET comprising:

a semiconductor substrate of a first conductivity type;

an epitaxial layer formed on said substrate;

a gate formed in a trench extending downward from a surface of said epitaxial layer;

a source region of said first conductivity type formed in said epitaxial layer adjacent said surface thereof;

a body region of a second conductivity type opposite to said first conductivity type formed in said epitaxial layer adjacent said source region and a wall of said trench, said source and body regions being formed in a cell of said MOSFET bordered on at least two sides by said trench;

a drain which comprises said substrate and a portion of said epitaxial layer located adjacent said body region, said portion of said epitaxial layer being doped with ions of said first conductivity type to a first concentration level; and

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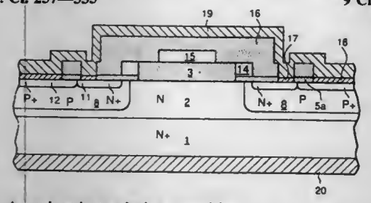
a buried layer formed within said epitaxial layer and extending continuously across said cell, said buried layer having an upper edge that is located at a level above an interface between said substrate and said epitaxial layer and a lower edge that is located at a level below said interface, a portion of said buried layer within said epitaxial layer being doped with ions of said first conductivity type to a second concentration level which is greater than said first concentration level.

5,814,859

SELF-ALIGNED TRANSISTOR DEVICE INCLUDING A PATTERNED REFRACTING DIELECTRIC LAYER

Mario Ghezzo, Ballston Lake; Tat-Sing Paul Chow, Schenectady; James William Kretchmer, Ballston Spa; Richard Joseph Saia, Schenectady, and William Andrew Hennessy, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 406,440, Mar. 20, 1995, Pat. No. 5,510,281. This application Nov. 15, 1995, Ser. No. 558,297
Int. Cl.[6] H01L *31/0312;29/76;29/94;31/062*
U.S. Cl. 257—335 **9 Claims**



1. A semiconductor device comprising:

a substrate comprising a semiconductor and having an epitaxial layer surface opposite a drain contact surface;

a semiconductor layer adjacent to the epitaxial layer surface of the substrate, the semiconductor layer comprising silicon carbide material of a first conductivity type;

a patterned refractory dielectric layer adjacent to the semiconductor layer;

a base region of implanted ions in the semiconductor layer, the base region being of a second conductivity type;

a source region of implanted ions in the base region, the source region being of the first conductivity type, the source region having a self-registered edge shifted with respect to the base region;

a gate insulator layer adjacent to at least a portion of the source and base regions of the semiconductor layer; and

a gate electrode over a portion of the gate insulator layer, adjacent to and in physical contact with an outer edge of the patterned refractory dielectric layer, and over at least a portion of the base region between the source region and the patterned refractory dielectric layer.

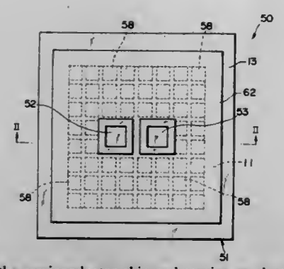
5,814,860

SEMICONDUCTOR IC DEVICE HAVING FIRST AND SECOND PADS ON SURFACE OF SEMICONDUCTOR CHIP

Kenichi Furuta, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1997, Ser. No. 804,828
Claims priority, application Japan, Oct. 2, 1996, 8-261781
Int. Cl.[6] H01L *29/76;29/94*
U.S. Cl. 257—335 **21 Claims**

1. A semiconductor IC device comprising a semiconductor chip including at least a first function region, a second function region, and a third function region, wherein a current flowing through the third function region is controlled by an electric signal input to the first function region; and a first and a second pad provided on a



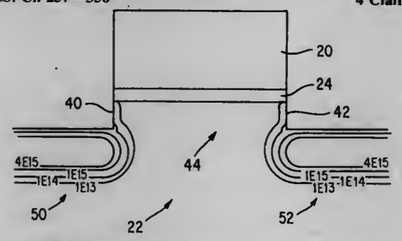
surface of the semiconductor chip and serving as electric connectors for the first and second function regions, wherein in the semiconductor chip, when there is no electric signal input to the first function region, a depletion layer is so formed as to surround the first and second function regions and between the first and second function regions, and the third function region, and wherein the first and second pads are arranged adjacent to each other substantially in a longitudinal and latitudinal center of the surface of the semiconductor chip.

5,814,861

SYMMETRICAL VERTICAL LIGHTLY DOPED DRAIN TRANSISTOR AND METHOD OF FORMING THE SAME

J. Neil Schunke; David Zaterka, and Thomas S. Taylor, all of Durham, N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Oct. 17, 1996, Ser. No. 733,311
Int. Cl.[6] H01L *21/336*
U.S. Cl. 257—336 **4 Claims**



1. An FET, comprising:

a semiconductor substrate including a first region having an upper surface and a second region, projecting upwardly from the first region and having an upper surface, the second substrate region having opposed sidewalls substantially normal to the upper surface of the first region;

a gate electrode formed through an insulating film on the upper surface of the projecting second region, and having opposing lateral ends in a channel length direction conforming with opposing lateral ends in the channel length direction of the projecting second region;

source/drain impurity regions formed in the first substrate region on opposite sides of said gate electrode and the sidewalls of the projecting second region, extending to the upper surface of the projecting second region; and

a channel region formed in the semiconductor substrate, under said gate electrode between said source/drain regions,

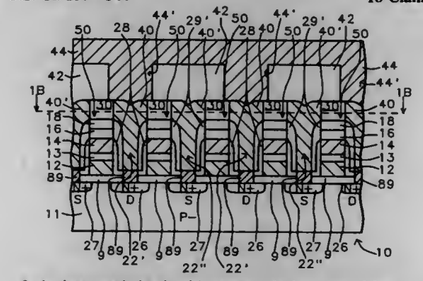
said source/drain impurity regions being non-diffusion regions formed by injecting ions at an oblique angle to the semiconductor substrate from a continuously rotating ion source, and having contours of equal ion concentration which are substantially non-Gaussian as a result of ions being injected into the opposed sidewalls of the second substrate region.

5,814,862

METALLIC SOURCE LINE AND DRAIN PLUG WITH SELF-ALIGNED CONTACTS FOR FLASH MEMORY DEVICE

Hung-Cheng Sung, Kaohsinng, Taiwan, and Ling Chen, Sunnyvale, Calif., assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Division of Ser. No. 511,062, Aug. 3, 1995, Pat. No. 5,631,179. This application Feb. 18, 1997, Ser. No. 801,659
Int. Cl.[6] H01L *29/76;29/94;31/062;31/113*
U.S. Cl. 257—344 **18 Claims**



1. An integrated circuit with memory devices comprising:

a semiconductor substrate having said memory devices therein to which electrical connections are made,

a tunnel oxide layer on said substrate,

an array of gate electrode stacks formed on said tunnel oxide layer, said stacks having sidewalls with trench spaces therebetween down to said tunnel oxide layer, and said sidewalls having oxidized sidewall films formed thereon,

said gate electrode stacks including a doped floating gate electrode over said tunnel oxide layer, an intergate dielectric layer over said floating gate electrode, a doped control gate electrode over said intergate dielectric layer,

a silicon dioxide first dielectric layer over said control gate electrode, and a silicon nitride (Si_3N_4) layer over said silicon dioxide layer,

ion implanted source/drain regions formed between said stacks with alternating source regions and drain regions below said trench spaces between said sidewall, said source/drain regions being aligned with said stacks,

spacers comprising dielectric structures composed of thin oxidized sidewall films contacting said sidewalls having a thickness from about 100 Å to about 200 Å covered with silicon nitride having a thickness from about 1500 Å to about 2000 Å contacting said thin sidewall oxide films and said first dielectric layer,

a second dielectric layer over said stacks, said trench spaces and said sidewalls,

said second dielectric layer having source line openings therein down to said source regions through said second dielectric layer, said sidewall, said spacers, and said tunnel oxide, and

said second dielectric layer having drain plug openings down to said drain regions between said spacers through said second dielectric layer and said tunnel oxide, down to said source regions and said drain regions,

source conductive metal lines (**40**) filling said source line openings and contacting said source regions through said source line openings, said source conductive lines being located between said stacks and said spacers over said source regions,

drain conductive metal lines filling said drain plug openings with drain plugs (**40'**) in contact with said drain regions through said drain plug openings, said drain plugs, (**40'**) being located over said drain regions and between said stacks and said spacers,

an intermetal dielectric layer (**42**) over said source lines,

via openings over said drain plugs through said intermetal dielectric layer, and

bit line metal (**44**) formed over said intermetal dielectric layer into said via openings extending down into contact with said drain plugs,

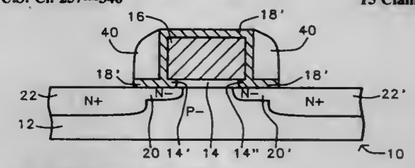
whereby said memory devices include metallic source lines and drain plugs.

5,814,863

SUBSTRATE WITH GATE ELECTRODE POLYSILICON/ GATE OXIDE STACK COVERED WITH FLUORINATED SILICON OXIDE LAYER AND FLUORINATED CORNERS OF GATE OXIDE LAYER

Yang Pan, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Company, Ltd., Singapore, Singapore

Division of Ser. No. 652,882, May 23, 1996, Pat. No. 5,672,525. This application Jun. 4, 1997, Ser. No. 868,604
Int. Cl.[6] H01L *29/78*
U.S. Cl. 257—346 **15 Claims**



1. An FET transistor comprising:

a stack of a gate oxide layer and a gate electrode on a surface of a doped semiconductor substrate with counterdoped source/drain regions therein,

said gate electrode having sidewalls,

a silicon oxide layer over said stack of said gate oxide layer and said gate electrode and over exposed portions of said semiconductor substrate including said source/drain regions,

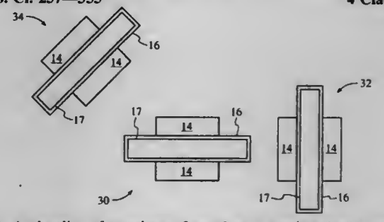
said silicon oxide layer and the corners of said gate oxide layer beneath said lower surface of said gate electrode having been fluorinated by rapid thermal processing providing a fluorinated silicon oxide layer extending beneath said lower surface of said gate electrode from about 100 Å to about 500 Å from said sidewalls of said gate electrode.

5,814,864

SEMICONDUCTOR CIRCUIT INCLUDING NON-ESD TRANSISTORS WITH REDUCED DEGRADATION DUE TO AN IMPURITY IMPLANT

David K. Y. Liu, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 550,424, Oct. 30, 1995, Pat. No. 5,652,155. This application Mar. 21, 1996, Ser. No. 620,099
Int. Cl.[6] H01L *23/62;29/04*
U.S. Cl. 257—355 **4 Claims**



1. A plurality of transistors formed on a semiconductor wafer comprising:

at least one non-electrostatic discharge protection transistor, the at least one non-electrostatic discharge protection transistor including a first spacer region and a first impurity implant region encroaching the first spacer region; and

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at least one electrostatic discharge protection transistor, the at least one electrostatic discharge protection transistor formed at a predetermined angular offset from the non-electrostatic discharge protection transistor, the electrostatic discharge protection transistor including a second spacer region, and a second impurity implant region, wherein the second impurity implant region encroaches the second spacer region further than the first impurity implant region encroaches the first spacer region.

5,814,865

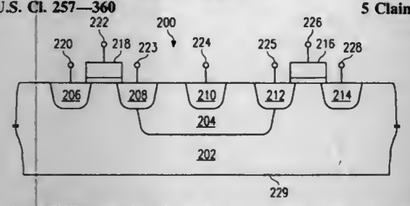
BIMODAL ESD PROTECTION FOR DRAM POWER SUPPLIES AND SCRS FOR DRAMS AND LOGIC CIRCUITS

Charvaka Duvvury, Plano, and Michael D. Chaine, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1996, Ser. No. 742,196

Int. Cl.[6] H01L *23/62*

U.S. Cl. 257—360 **5 Claims**



1. An ESD protection circuit for protecting a circuit, said ESD protection circuit comprising:

a substrate of a first conductivity type and having a surface;

a lightly doped region of a second conductivity type opposite said first conductivity type and situated in said substrate;

a first doped region of said first conductivity type and situated at said surface of said substrate and in said lightly doped region, said first doped region forming the anode of a first diode and a second diode;

a first source region of said second conductivity type and situated at said surface of said substrate and spaced away from said lightly doped region;

a first drain region of said second conductivity type and situated at said surface of said substrate, spaced away from said first source region by a first channel region, and abutting said lightly doped region, said first drain region forming the cathode of said first diode;

a first gate insulatively disposed over said first channel region, said first source region, first drain region and said first gate forming a first transistor;

a second source region of said second conductivity type and situated at said surface of said substrate and spaced away from said lightly doped region;

a second drain region of said second conductivity type and situated at said surface of said substrate, spaced away from said second source region by a second channel region, and abutting said lightly doped region, said second drain region forming the cathode of said second diode;

a second gate insulatively disposed over said second channel region, said second source region, second drain region and said second gate forming a second transistor;

and wherein said first source region, said first gate, said second source region, said second gate, and said first doped region are electrically connected to each other and said first and second drain regions are electrically connected to each other.

5,814,866

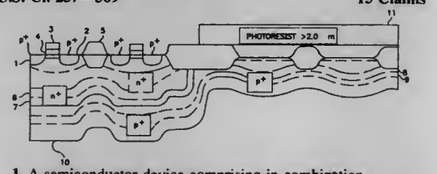
SEMICONDUCTOR DEVICE HAVING AT LEAST ONE FIELD OXIDE AREA AND CMOS VERTICALLY MODULATED WELLS (VMW) WITH A BURIED IMPLANTED LAYER FOR LATERAL ISOLATION HAVING A FIRST PORTION BELOW A WELL, A SECOND PORTION FORMING ANOTHER, ADJACENT WELL, AND A VERTICAL PO

John O. Borland, South Hamilton, Mass., assignor to Genus, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 343,116, Nov. 22, 1994, Pat. No. 3,501,993. This application Mar. 18, 1996, Ser. No. 617,293

Int. Cl.[6] H01L *29/76;29/94*

U.S. Cl. 257—369 **15 Claims**



1. A semiconductor device comprising in combination

a p-substrate having an impurity concentration of 10^{15}/cc and a surface having at least one field oxide area

a retrograde n-well therein having a high concentration portion having a concentration of about 10^{18}/cc extending between a depth of 1 micron and a depth of 2 microns, and extending parallel to said surface from a point under said field oxide area in a first direction, and

a BILLI p-layer therein having a concentration of about 10^{18}/cc, having a very deep horizontal portion below said n-well at a depth of about 3 microns,

having a deep horizontal portion forming a deep retrograde p-well, adjacent said n-well, which extends between a depth of 1 micron and 1.5 micron and which extends parallel to said surface from said point in a second direction opposite to said first direction, and

having a vertical portion connecting said very deep horizontal portion to said deep horizontal portion,

said surface having active sites separated by said field oxide area,

said field oxide area extending along said surface in said first and second directions no more than 3 microns,

the impurity concentration distribution in depth underneath the field oxide varying from a low but not negligible value directly under the field oxide to a maximum value at about 3 microns, thereby providing sufficient impurity concentration to kill lateral beta while restraining the concentration near the surface so as to prevent damage to the semiconductor material.

5,814,867

SEMICONDUCTOR DEVICE AND FABRICATION METHOD THEREOF

Satoshi Saito, Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 25, 1995, Ser. No. 548,197

Claims priority, application Japan, Apr. 14, 1995, 7-089356

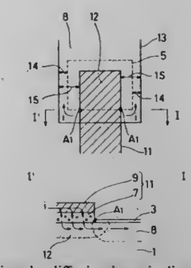
Int. Cl.[6] H01L *29/78;29/76*

U.S. Cl. 257—379 **10 Claims**

1. A semiconductor device comprising:

a pair of transistors being formed on an active region defined on a surface of a semiconductor substrate, and each having a gate insulation film formed on the active region, a gate electrode formed on the gate insulation film and a diffusion layer formed in the active region of the semiconductor substrate, each said gate electrode having an outer periphery,

one of the transistors having an opening formed by removing part of the gate insulation film on the active region, through



which opening the diffusion layer is directly connected to the gate electrode of the other transistor, the outer periphery of an end portion of the gate electrode of the other transistor intersecting the outer periphery of the opening at least one point on the diffusion layer.

5,814,868

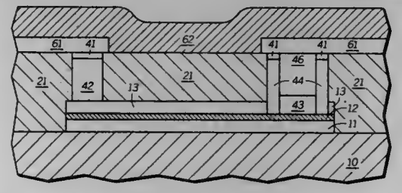
TRANSISTOR HAVING AN OFFSET CHANNEL SECTION

Scott S. Roth; William C. McFadden, and Alexander J. Pepe, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 95,502, Jul. 22, 1993, Pat. No. 5,374,572. This application Sep. 2, 1994, Ser. No. 298,965

Int. Cl.[6] H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—393 **18 Claims**



1. A field-effect transistor comprising:

a gate electrode over a substrate;

a gate dielectric layer over the gate electrode;

a semiconductor layer over the gate dielectric layer;

an insulating layer including a first opening and a second opening over the semiconductor layer, wherein:

each of the first and second openings has a bottom and a top;

the first opening has a first width; and

the second opening has a second width that is wider than the first width;

a first semiconductor portion that lies within first opening and overlies the semiconductor layer, wherein:

the first semiconductor portion has a first region and a second region;

the first region is heavily doped and lies adjacent to the top of the first opening; and

the second region is not heavily doped and lies adjacent to the bottom of the first opening;

a second semiconductor portion that lies within second opening and overlies the semiconductor layer, wherein:

the second semiconductor portion has a first region and a second region;

the first region is heavily doped and lies adjacent to the top of the second opening; and

the second region is heavily doped and lies adjacent to the bottom of the second opening.

5,814,869

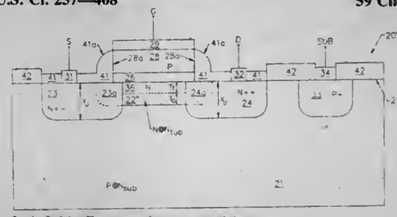
SHORT CHANNEL FERMI-THRESHOLD FIELD EFFECT TRANSISTORS

Michael W. Dennen, Raleigh, N.C., assignor to Thunderbird Technologies, Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 351,643, Dec. 7, 1994, Pat. No. 5,543,654, which is a continuation-in-part of Ser. No. 37,636, Feb. 23, 1993, Pat. No. 5,374,836, which is a continuation-in-part of Ser. No. 977,689, Nov. 18, 1992, Pat. No. 5,369,295, which is a continuation of Ser. No. 826,939, Jan. 28, 1992, Pat. No. 5,194,923. This application Jul. 21, 1995, Ser. No. 505,085

Int. Cl.[6] H01L *29/76;29/94*

U.S. Cl. 257—408 **59 Claims**



1. A field effect transistor comprising:

a semiconductor substrate of first conductivity type;

a tub region of second conductivity type in said substrate at a surface thereof, and extending a first depth from said substrate surface;

spaced apart source and drain regions of said second conductivity type in said tub region, said spaced apart source and drain regions extending from said substrate surface to beyond said first depth;

a channel region of said second conductivity type in said tub region, between said spaced apart source and drain regions, and extending a second depth from said substrate surface, wherein said second depth is less than said first depth,(at least one of said first and second depths being selected to minimize the static electric field perpendicular to said substrate surface,) from said substrate surface to said second depth;

a gate insulating layer on said substrate surface, between said spaced apart source and drain regions; and

source, drain and gate electrodes contacting said source and drain regions and said gate insulating layer, respectively.

5,814,870

SEMICONDUCTOR COMPONENT

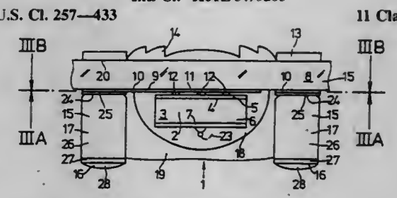
Werner Spaeth, Holzkirchen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 6, 1997, Ser. No. 779,366

Claims priority, application Germany, Jan. 5, 1996, 196 00 306.7

Int. Cl.[6] H01L *31/0203*

U.S. Cl. 257—433 **11 Claims**



1. A semiconductor component, comprising:

a component housing, said housing being formed by a carrier part having a first surface and defining an upper housing portion and by at least two housing side parts, said housing side parts being micromechanical supports at least partly formed by two electrode connectors;

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a semiconductor chip of a given height disposed in said housing and mounted on said first surface of said carrier part, said semiconductor chip being at least partly surrounded by said carrier part and said electrode connectors, said semiconductor chip being mounted on said carrier part and being electrically connected with said electrode connectors; and

contacts disposed on said micromechanical supports on ends thereof distally of said carrier part; and

wherein said micromechanical supports have a height which slightly exceeds the given height of said semiconductor chip, and said micromechanical supports are affixed laterally of said semiconductor chip on said first surface.

5,814,871

OPTICAL SEMICONDUCTOR ASSEMBLY HAVING A CONDUCTIVE FLOAT PAD

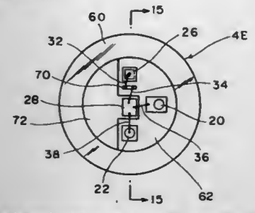
Hiroyuki Furukawa, Sapporo; Hironao Hakogi, and Yoshio Shimano, both of Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Jan. 27, 1997, Ser. No. 789,663

Claims priority, application Japan, Aug. 15, 1996, 8-215816

Int. Cl.[6] H01L *31/0232;31/0203;33/00*

U.S. Cl. 257—433 **8 Claims**



1. An optical semiconductor assembly comprising:

a metal stem;

first and second leads provided so as to be insulated from said stem and pass through said stem;

a hermetic glass substrate fixed on said stem;

a conductive float pad provided on said hermetic glass substrate;

a third lead provided so as to be insulated from said stem and pass through said hermetic glass substrate and said stem, said third lead having a lead head;

an optical semiconductor element mounted on said lead head of said third lead;

a bare chip integrated circuit mounted on said stem;

a first bonding wire for connecting said optical semiconductor element and said float pad;

a second bonding wire for connecting said float pad and said bare chip integrated circuit;

a third bonding wire for connecting said bare chip integrated circuit and said first lead; and

a fourth bonding wire for connecting said bare chip integrated circuit and said second lead.

5,814,872

INTEGRATED CIRCUIT AND THIN FILM INTEGRATED CIRCUIT

Satoshi Noda; Hiroyuki Miyake; Kazuhiro Sakai, and Shin Takeuchi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 422,951, Apr. 17, 1995, abandoned. This application Apr. 7, 1997, Ser. No. 833,533

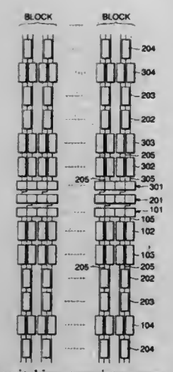
Claims priority, application Japan, May 25, 1994, 6-133874

Int. Cl.[6] H01L *31/0224;31/04;27/146*

U.S. Cl. 257—448 **12 Claims**

1. An integrated circuit, comprising:

a plurality of blocks, each of said blocks including a plurality of light receiving element arrays,



a plurality of switching transistor arrays placed in parallel relation and respectively connected to said light receiving element arrays, and

a plurality of wiring electrodes, each of said wiring electrodes connected to a first one of said plurality of light receiving element arrays and extending between switching transistors of one of said plurality of switching transistor arrays connected to a second one of said plurality of light receiving element arrays,

wherein the number of light receiving elements of said plurality of light receiving element arrays is even and each of said wiring electrodes connected to said first light receiving element array is placed between every two switching transistors of said switching transistor array connected to said second light receiving element array.

5,814,873

SCHOTTKY BARRIER INFRARED SENSOR

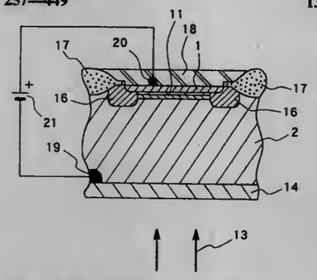
Kazuo Konuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 699,821, Jun. 26, 1996, abandoned, which is a continuation of Ser. No. 498,130, Jul. 5, 1995, abandoned. This application Sep. 2, 1997, Ser. No. 916,158

Claims priority, application Japan, Jul. 5, 1994, 6-175956

Int. Cl.[6] H01L *31/00;27/295;29/812;31/07*

U.S. Cl. 257—449 **13 Claims**



1. A Schottky barrier infrared sensor comprising:

a first layer of a first conductivity type;

a second layer of one of metal and metal silicide;

a guard ring layer of a second conductivity type embedded in said first layer to a predetermined depth and encircling said second layer, said first layer and said second layer being joined to each other at a junction interface for detecting incident infrared radiation,

wherein the detecting of the incident infrared radiation is based on the amount of excessive carriers generated in said first layer in response to passage of hot carriers through a depletion layer, said depletion layer being formed in said first layer in a position which is immediately adjacent said junction interface and surrounded by said guard ring layer, said hot carriers being generated in said second layer by the incident infrared radiation; and

a third layer disposed in the depletion layer at a depth less than said predetermined depth and out of contact with said junction interface, said third layer containing an impurity which is introduced for positioning an effective barrier in said depletion layer.

5,814,874

SEMICONDUCTOR DEVICE HAVING A SHORTER SWITCHING TIME WITH LOW FORWARD VOLTAGE

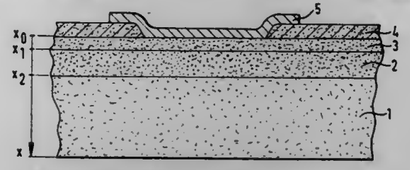
Guenter Igel, Emmendingen, Germany, assignor to General Semiconductor Ireland, Macroon, Ireland

Filed Jul. 16, 1996, Ser. No. 680,669

Claims priority, application Germany, Jul. 21, 1995, 195 26 739.7

Int. Cl.[6] H01L *27/075;29/47;29/812;31/07*

U.S. Cl. 257—475 **18 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a first epitaxial layer of silicon deposited on said semiconductor substrate; and

a second epitaxial layer of silicon deposited on said first epitaxial layer, wherein said first epitaxial layer of silicon has a predetermined dopant concentration within a range of from 5×10^{14} cm^{-3} to 5×10^{16} cm^{-3} and said second epitaxial layer of silicon has a predetermined dopant concentration lower than that of said first epitaxial layer;

wherein said first epitaxial layer has a thickness which is substantially twice the thickness of said second epitaxial layer.

5,814,875

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME APPARATUS AND METHOD FOR PROVIDING SEMICONDUCTOR DEVICES HAVING A FIELD SHIELD ELEMENT BETWEEN DEVICES

Yoshihiro Kumazaki, Chiyoda-ku, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 594,301

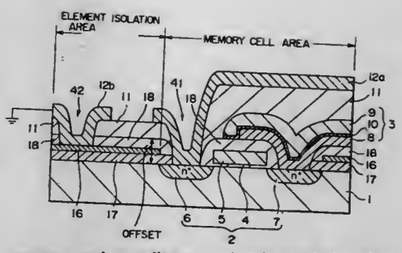
Claims priority, application Japan, Jan. 31, 1995, 7-034492

Int. Cl.[6] H01L *29/76;29/78*

U.S. Cl. 257—488 **11 Claims**

1. A semiconductor device where isolation between semiconductor devices is carried out by a field shield element isolation structure in which a shield gate electrode is formed through an insulating film on a semiconductor substrate,

wherein the shield gate electrode includes a high melting point metal, said high melting point metal having a lower etching speed than said insulating film to prevent punch through of said shield gate during etching of said insulating film, permitting a reduced shield gate electrode thickness which proportionally reduces a vertical offset between said field isolation



structure and an adjacent semiconductor device along a boundary with said adjacent semiconductor device.

5,814,876

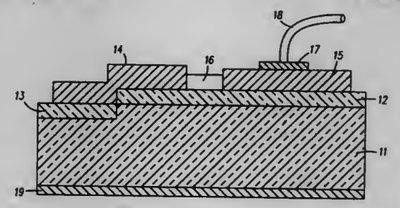
SEMICONDUCTOR FUSE DEVICES

Andre Peyre-Lavigne, Lacroix Falgarde; Jean Michel Reynes, Pomlertuzat; Emmanuel Scheid, Corronsac, and Danielle Bielle Daspet, Labege, all of France, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 511,569, Aug. 4, 1995, abandoned. This application Apr. 7, 1997, Ser. No. 838,472

Int. Cl.[6] H01L *27/10;29/00*

U.S. Cl. 257—529 **8 Claims**



1. A semiconductor igniter device for igniting a pyrotechnic material, comprising:

a conductive semiconductor substrate having a top surface and a bottom surface;

a layer of dielectric material on a first portion of the top surface of said substrate;

a first conductive layer wholly formed on a first portion of said layer of dielectric material and forming a first contact of said semiconductor igniter device;

a second conductive layer formed directly on a second portion of the top surface of said substrate and extending over a second portion of said layer of dielectric material, said second conductive layer being spaced from said first conductive layer;

a third conductive layer provided on the bottom surface of said substrate, said third conductive layer forming a second contact of said semiconductor igniter device, wherein a conductive path through said substrate is provided between said second conductive layer and said third conductive layer; and

a fuse portion formed wholly on said layer of dielectric material and extending between and in electrical contact with said first and second conductive layers, said fuse portion igniting the pyrotechnic material when a current flows between the first and second contacts of said semiconductor igniter device.

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5,814,877

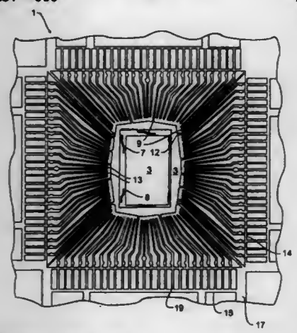
SINGLE LAYER LEADFRAME DESIGN WITH GROUNDPLANE CAPABILITY

Steven Joel Diffenderfer, Deposit, and Hussain Shaukatullah, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 319,525, Oct. 7, 1994, Pat. No. 5,543,657. This application Mar. 4, 1996, Ser. No. 610,188

Int. Cl.[6] H01L *23/495*

U.S. Cl. 257—666 **20 Claims**



1. A leadframe, comprising:

a single layer of an electrically conducting material;

a semiconductor chip support;

a common ground portion surrounding said semiconductor chip support and electrically connected thereto;

a plurality of signal leads electrically isolated from each other and from said common ground portion; and

a plurality of ground leads electrically connected to said common ground portion.

5,814,878

SEMICONDUCTOR DEVICE

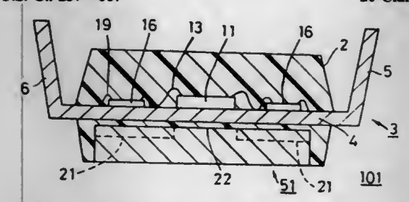
Satoshi Hirakawa, and Haruo Takao, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1996, Ser. No. 664,498

Claims priority, application Japan, Nov. 30, 1995, 7-312556

Int. Cl.[6] H01L *23/495*

U.S. Cl. 257—667 **20 Claims**



1. A semiconductor device, comprising:

a planer electrically conducting lead frame having first and second surfaces;

at least one power semiconductor element fixed on said first surface of said lead frame;

a thermally conducting heat sink having a first surface entirely facing said second surface of said lead frame with a gap therebetween; and

an electrically insulating sealing resin which fills said gap so as to couple and electrically insulate said lead frame and said heat sink and seal said power semiconductor element;

wherein:

said heat sink has first and second regions defined in said first surface;

said first region is flat;

said second region is divided in two sub-regions and at least one groove is formed in each of said sub-regions;

said at least one power semiconductor element is disposed on said first surface of said lead frame over said first region of said heat sink;

said first region is defined at a center portion of said first surface; and

said two sub-regions are disposed on each side of said first region.

5,814,879

TAPE CARRIER DEVICE HAVING AN ADHESIVE RESIN OVERCOAT AND A POLYIMIDE RESIN-BASED OVERCOAT

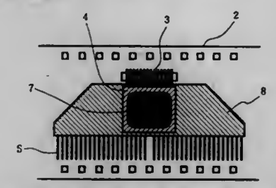
Masaharu Ishisaka, Okegawa; Takeshi Nou, Ageo, and Naoyuki Tajima, Osaka, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., and Sharp Kabushiki Kaisha, both of Osaka, Japan

Division of Ser. No. 98,428, Jul. 27, 1993, Pat. No. 5,477,080. This application Oct. 4, 1995, Ser. No. 538,627

Claims priority, application Japan, Jan. 20, 1992, HEI 4-27531; Dec. 28, 1992, HEI 4-358607

Int. Cl.[6] H01L *23/495;23/29*

U.S. Cl. 257—668 **15 Claims**



1. A tape carrier comprising an insulating film, a pattern formed of a metal foil on at least one side surface of said film, a polyimide resin-based overcoat and an adhesive resin overcoat, said adhesive resin overcoat being made of a resinous material other than the resinous material of said polyimide resin-based overcoat, said adhesive resin overcoat being applied to a pattern surface portion around the periphery of a portion coated with an IC sealing resin, said polyimide resin-based overcoat being applied to the remaining pattern surface portion, said adhesive resin overcoat extending over said pattern surface portion, said polyimide resin-based overcoat having an area, said adhesive resin overcoat having an area, the area of said adhesive resin overcoat being smaller than the area of said polyimide resin-based overcoat whereby warping of said tape carrier is minimized.

5,814,880

THICK FILM COPPER METALLIZATION FOR MICROWAVE POWER TRANSISTOR PACKAGES

John A. Costello, Annapolis, Md.; Harry Buhay, Allison Park, Pa.; Richard R. Papania, Pittsburgh, Pa.; Prosenjit Rai-Choudhury, Export, Pa.; Kenneth J. Petrosky, Severna Park, Md., and Gene A. Madia, Plum Borough, Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation of Ser. No. 793,233, Nov. 8, 1991, abandoned, which is a continuation of Ser. No. 453,287, Dec. 22, 1989, abandoned. This application Jan. 29, 1993, Ser. No. 11,094

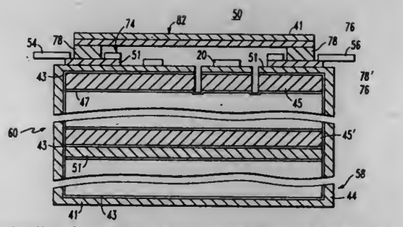
Int. Cl.[6] H01L *23/14*

U.S. Cl. 257—678 **44 Claims**

1. A power microwave generating transistor module, comprising:

a thermally conductive metallic plate for supporting a plurality of electronic components;

a plurality of spaced inductive, capacitive, and resistive components mounted on the metallic plate;



a plurality of power microwave transistor packages spaced from the inductive, capacitive, and resistive components, and from each other mounted on the metallic plate;

the plurality of components, and the transistors of the transistor packages being interconnected electrically to produce an alternating output signal of a predetermined wattage, each transistor package including:

a metallic base member fixedly attached to and in physical engagement with the metallic plate for conducting heat from the base member to the metallic plate,

a substrate having a ceramic core with first and second opposite planar surfaces, each of the planar surfaces having a layer of copper with a thickness in the range of approximately 0.5 to 7 mils bonded to the ceramic core by a metallic film, a layer of nickel having a thickness substantially less than the copper layer plated on the copper layer, at least a portion of the first planar surface being electrically isolated from the metal base member for supporting a plurality of power microwave transistors, the copper layer having the characteristics and thickness to spread heat from a plurality of power microwave transistors mounted on the first electrically isolated planar surface, the second planar surface being brazed to the metallic base member;

a frame assembly brazed to one of either the metallic layer of the substrate or the metallic base member surrounding and spaced from the electrically isolated first planar surface of the substrate for connecting electrically at least two terminals exterior the respective package, the two terminals being electrically isolated from the substrate and the base member and from each other;

a plurality of power microwave transistors mounted to the electrically isolated first planar surface of the substrate; and

a metallic cover bonded to the frame assembly for hermetically sealing the plurality of transistors within the respective package.

5,814,881

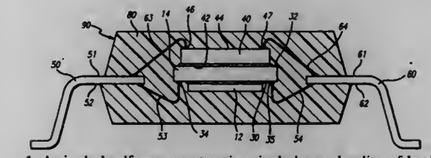
STACKED INTEGRATED CHIP PACKAGE AND METHOD OF MAKING SAME

Maniam Alagaratnam; Qwai H. Low, and Chok J. Chia, all of Cupertino, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 20, 1996, Ser. No. 770,872

Int. Cl.[6] H01L *23/02*

U.S. Cl. 257—686 **23 Claims**



1. A single leadframe construction, includes a plurality of leadframe conductors and a molded body member for supporting the conductors in substantially fixed positions, comprising:

a leadframe die paddle;

said leadframe die paddle dimensioned to permit the die paddle to be encapsulated entirely within the molded body member and in a spaced apart manner from each individual one of the plurality of leadframe conductors;

an integrated circuit chip disposed in said molded body member includes a backface surface and a frontface surface having plurality of bonds pads disposed at about its periphery;

said integrated circuit chip dimensioned to permit the chip to be encapsulated entirely within the molded body member in a spaced apart manner from each individual one of the plurality of leadframe conductors,

said integrated circuit chip dimensioned to enable said integrated chip to be supported from below by said leadframe die paddle in frontface surface abutment without any individual one of said plurality of bond pads being obstructed by said leadframe die paddle;

another integrated circuit chip disposed in said molded body member and having a backside surface and a front side surface with another plurality of bond pads disposed at about its periphery;

said another integrated circuit chip dimensioned to permit the another chip to be encapsulated entirely within the molded body member in a spaced apart manner from each individual one of the plurality of leadframe conductors and dimensioned to be supported from below by said integrated circuit in backside to backface surface abutment so that said another plurality of bond pads are completely unobstructed by said integrated circuit and said leadframe die paddle; and

a plurality of lead wires for interconnecting selected ones of the plurality of bonds pads of said integrated circuit and said another integrated circuit with selected ones of the leadframe conductors.

5,814,882

SEAL STRUCTURE FOR TAPE CARRIER PACKAGE

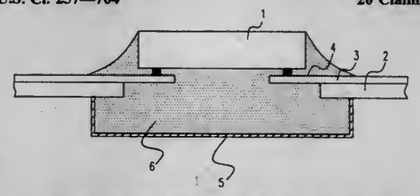
Yuzo Shimada, and Koetsu Tamura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 498,797

Claims priority, application Japan, Jul. 20, 1994, 6-167620

Int. Cl.[6] H01L *23/12;23/495;23/28;23/52*

U.S. Cl. 257—704 **20 Claims**



1. A seal structure for a tape carrier package comprising:

an organic insulation film formed with a conductor pattern;

inner leads electrically connected to said conductor pattern;

a chip electrically connected to said inner leads to establish a structure wherein a connecting portion between a circuit surface of said chip and said inner leads 15 covered with a plastic member; and

a cap for covering said plastic member projecting from a back surface of said organic insulation film, wherein said chip sits above said inner leads projecting from a front surface of said organic insulation film.

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5,814,883

PACKAGED SEMICONDUCTOR CHIP

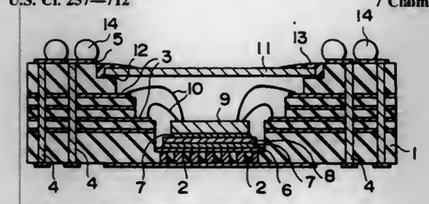
Akiyoshi Sawai; Kisamitsu Ono; Hideyuki Ichiyama, all of Tokyo, and Katsunori Asai, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Eengineering Corporation, Hyogo, both of Japan

Filed May 1, 1996, Ser. No. 640,504

Claims priority, application Japan, Oct. 4, 1995, 7-257671

Int. Cl.[6] H01L *23/12;23/48;23/38;23/36*

U.S. Cl. 257—712 **7 Claims**



1. A semiconductor device comprising:

a laminated substrate including a plurality of laminated glass-epoxy layers, a stepped recess having a bottom, and a plurality of through-holes filled with an electrically conductive material and extending through the laminated layers;

a semiconductor chip disposed on the bottom of the recess;

a plurality of external electrodes comprising a respective solder ball corresponding to each of the through-holes and disposed on said laminated substrate beside, but not directly opposite the respective through-hole;

a lid bonded to said laminated substrate, covering the recess, and defining, with the recess, an internal volume; and

radiating means disposed between said semiconductor chip and said laminated substrate for transmitting heat from said semiconductor chip to said laminated substrate for radiation, said radiating means comprising a thermal via including a through-hole in said laminated substrate, a metal film on an inner wall of, but not filling, the through-hole and in contact with the metal film.

5,814,884

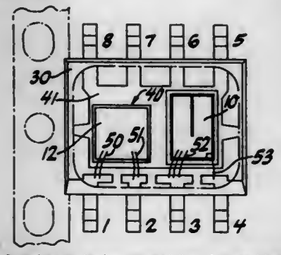
COMMONLY HOUSED DIVERSE SEMICONDUCTOR DIE

Christopher Davis, Thousand Oaks; Chuan Cheah, and Daniel M. Kinzer, both of El Segundo, all of Calif., assignors to International Rectifier Corporation

Filed Mar. 18, 1997, Ser. No. 816,829

Int. Cl.[6] H01L *23/24;23/48;23/52*

U.S. Cl. 257—723 **40 Claims**



1. A semiconductor device comprising, in combination, a first semiconductor die having opposing surfaces which contain respective electrodes, a second semiconductor die having opposing surfaces which contain respective electrodes, a thin conductive lead frame having a common main pad area having a first plurality of parallel pins integral with and extending from one edge thereof, and a second plurality of pins separated from one another and from said main pad area; said second plurality of pins being disposed along an edge of said main pad area opposite to the side thereof containing said first plurality of pins; one of said opposing surfaces of each of said first and second semiconductor die being disposed atop and in electrical contact with said common main pad area and being laterally spaced from one another; the opposite ones of said opposing surfaces of said first and second die being wire bonded to respective ones of said second plurality of pins; and a molded housing for encapsulating said lead frame and said first and second die and said bonding wires; said first and second pins extending beyond the boundary of said molded housing and available for external connection.

5,814,885

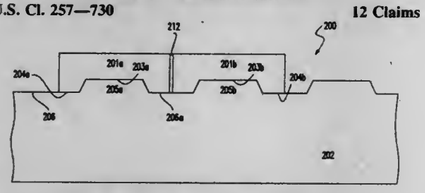
VERY DENSE INTEGRATED CIRCUIT PACKAGE

H. Bernhard Pogge, Hopewell Junction, N.Y.; Johann Greschner, Pliezhausen, Germany, and Howard L. Kalter, Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1997, Ser. No. 848,037

Int. Cl.[6] H01L *29/04;23/06*

U.S. Cl. 257—730 **12 Claims**



1. An integrated circuit package, comprising:

an integrated circuit chip and a carrier substrate;

said carrier substrate having a surface projection which has a sloping sidewall;

said circuit chip having a surface depression with a beveled side edge matching said sloping wall; and

said beveled edge and said sloping sidewall being in conformal juxtaposition, whereby said chip is positioned on said projection.

5,814,886

SEMICONDUCTOR DEVICE HAVING LOCAL CONNECTIONS FORMED BY CONDUCTIVE PLUGS AND METHOD OF MAKING THE SAME

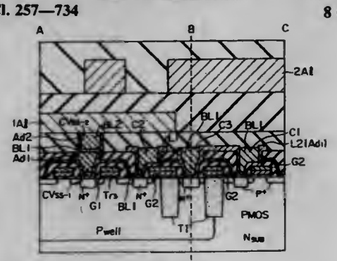
Michio Mano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 15, 1996, Ser. No. 698,436

Claims priority, application Japan, Aug. 17, 1995, 7-209796

Int. Cl.[6] H01L *21/90*

U.S. Cl. 257—734 **8 Claims**



1. A semiconductor device comprising:

a transistor formed on a substrate;

a first interlayer insulating film covering said transistor;

a first interconnection which is connected to said transistor via a first contact hole through the first interlayer insulating film;

a second interlayer insulating film on the first interlayer insulating film; and

a second interconnection which is connected to the first interconnection via a second contact hole through the second interlayer insulating film;

said first-interconnection functioning as a local connection;

said first interconnection including a conductive plug filling said first contact hole;

said second interconnection including a conductive plug filling said second contact hole.

5,814,887

SEMICONDUCTOR DEVICE AND PRODUCTION METHOD THEREOF

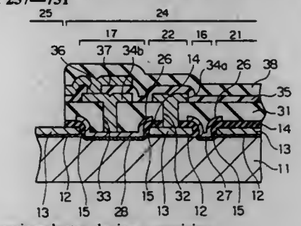
Tomofune Tani, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 20, 1996, Ser. No. 754,298

Claims priority, application Japan, Jan. 26, 1996, 8-032666

Int. Cl.[6] H01L *23/48*

U.S. Cl. 257—751 **8 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having an impurity diffusion layer formed in a predetermined area;

a pad electrode formed on said semiconductor substrate and connected to said impurity diffusion layer;

an inter-layer insulating film formed over said semiconductor substrate inclusive of said pad electrode, and having a contact trench which forms a trench loop in said inter-layer insulating film thereby dividing said inter-layer insulating film into a first area which is encompassed by said trench loop and a second area which is not encompassed by said trench loop;

a conductor film formed at least inside said contact trench along said trench loop and connected to said pad electrode thereby encompassing a side surface of the first area of said inter-layer insulating film; and

a protective film formed over said semiconductor substrate inclusive of said conductor film and said interlayer insulating film.

5,814,888

SEMICONDUCTOR DEVICE HAVING A MULTILAYER WIRING AND THE METHOD FOR FABRICATING THE DEVICE

Yasushiro Nishioka; Tsuyoshi Tanaka; Kyung-ho Park, and Yasutoshi Okuno, all of Ibaraki, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 461,460, Jun. 5, 1995, abandoned. This application Mar. 21, 1997, Ser. No. 821,489

Claims priority, application Japan, Jun. 6, 1994, 6-123871

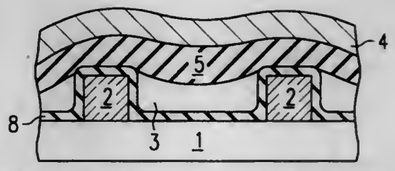
Int. Cl.[6] H01L *23/48;23/52;29/40;29/00*

U.S. Cl. 257—758 **18 Claims**

1. A semiconductor device with multilayer wiring, comprising:

an insulating substrate;

a first wiring layer of wires formed on the insulating substrate leaving grooves between the wires which are wider than a width of said wires;



a contracted, undulating interlayer insulating film covering the wires and spanning the grooves to enclose voids having a width wider than said wires; and

a second wiring layer of wires formed on the interlayer insulating film;

whereby the voids enclosed by the undulating interlayer insulating film reduce the capacitance between wires of said first wiring layer.

5,814,889

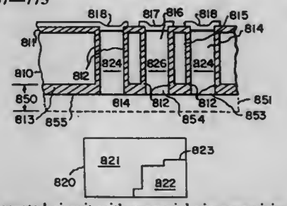
INTERGRATED CIRCUIT WITH COAXIAL ISOLATION AND METHOD

Stephen Joseph Gaul, Melbourne, Fla., assignor to Harris Corporation, Palm Bay, Fla.

Filed Jun. 5, 1995, Ser. No. 461,037

Int. Cl.[6] H01L *27/00*

U.S. Cl. 257—773 **6 Claims**



1. An integrated circuit with a coaxial via comprising:

a wafer of semiconductor material with first and second surfaces and with integrated circuits formed on the first surface of said wafer;

a first via comprising inner and outer walls spaced from each other and extending from a first open end on the first surface of the wafer to a second open end on the second surface of the second surface, said inner wall of said first via enclosing a portion of said wafer;

a second via in the portion of the wafer enclosed by said inner wall of said first via, said second via having a first open end on the first surface of the wafer, an elongated, open passage extending to a second open end of the via on the second surface

a dielectric surface on each wall of the vias; and

a conductive material filling said vias.

5,814,890

THIN-TYPE SEMICONDUCTOR PACKAGE

Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 1, 1995, Ser. No. 396,234

Claims priority, application Japan, Mar. 2, 1994, 6-032296

Int. Cl.[6] H01L *23/48*

U.S. Cl. 257—778 **6 Claims**

1. A semiconductor package, comprising:

a circuit board having first and second surfaces and having a wiring circuit including a connecting portion on the first surface;

a semiconductor chip having first and second surfaces and mounted face-down with the first surface thereof confronting the first surface of the circuit board;

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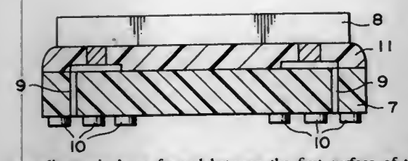


a sealing resin layer formed between the first surface of the semiconductor chip and the first surface of the circuit board; and

a plurality of flat external connecting terminals electrically connected to the semiconductor chip and formed on the second surface of the circuit board,

wherein the plurality of flat external connecting terminals are arranged with constant pitches in a lattice shape so that standard sockets for testing the semiconductor chip can be used, the plurality of external connecting terminals being formed on the second surface of the circuit board according to:

$$m=INT[(h-2f)/a]+1,$$

$$n=INT[(v-2f)/a]+1,$$

where h is a width of the circuit board, v is a length of the circuit board, a is the pitch of the external connecting terminals, f is a distance between a center of the an outermost external connecting terminal and a corresponding edge of the circuit board, m is a number of external connecting terminals in a width direction of the circuit board, and n is a number of external connecting terminals in a length direction of the circuit board.

5,814,891

FLIP-CHIP CONNECTING TYPE SEMICONDUCTOR DEVICE

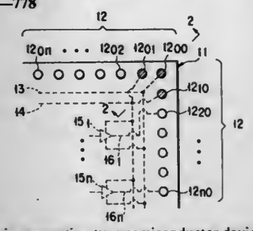
Naohiko Hirano, Kawasaki, Japan, assignor to Kabushiki Kaisha Tosbiba, Kawasaki, Japan

Filed Jan. 3, 1996, Ser. No. 582,580

Claims priority, application Japan, Jan. 11, 1995, 7-002509

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—778 **23 Claims**



1. A flip-chip connecting type semiconductor device comprising:

a semiconductor chip on which active elements are formed and which has a peripheral part having a surface and a plurality of corner portions;

a power supply system wiring disposed in said semiconductor chip;

a signal wiring disposed in said semiconductor chip; and

a plurality of bumps arranged along the surface of the peripheral part of said semiconductor chip and used for connecting said semiconductor chip to a substrate;

wherein the bumps among said plurality of bumps which are formed on at least one of the corner portions are connected to said power supply system wiring and the bumps formed on the surface of the peripheral part other than the corner portions are connected to said signal wiring.

5,814,892

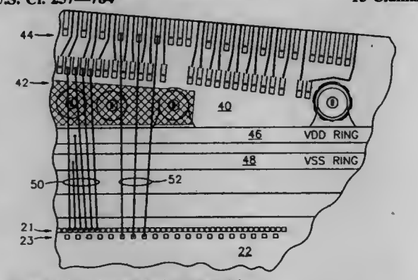
SEMICONDUCTOR DIE WITH STAGGERED BOND PADS

Michael J. Steidl, Fremont, and Sanjay Dandia, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 7, 1996, Ser. No. 660,490

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—784 **13 Claims**



1. A semiconductor device comprising:

a semiconductor die having a first surface and a first edge;

an outer row of conductive connectors disposed on said die substantially parallel to said first edge at a first distance from said first edge;

an inner row of conductive connectors disposed on said die and positioned adjacent to said outer row at a second distance from said first edge that is greater than said first distance;

said outer row having a greater number of connectors than said inner row;

a plurality of conducting traces adjacent one another and separated one from the other by a third distance, said plurality of conducting traces disposed between and separated from connectors of the inner row by a fourth distance, each of said traces being connected to a unique one of said connectors in said outer row, and

the conductive connectors of the inner and outer rows staggered such that adjacent conductive connectors of the inner row are separated by at least two of the plurality of conducting traces.

5,814,893

SEMICONDUCTOR DEVICE HAVING A BOND PAD

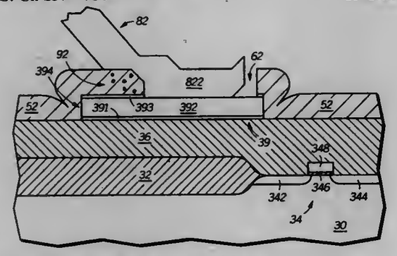
Ting-Chen Hsu; Edward O. Travis; Clifford M. Howard, all of Austin, and Stephen G. Jamison, Buda, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 376,208, Jan. 20, 1995, Pat. No. 5,661,082.

This application Feb. 13, 1997, Ser. No. 799,925

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—784 **15 Claims**



1. A semiconductor device comprising:

a first interconnect and a second interconnect;

a first bond pad having a first conductive section and a second bond pad having a second conductive section, wherein:

the first bond pad lies adjacent to the first interconnect; and

the second bond pad lies adjacent to the second interconnect; and

a passivation layer including a first bond pad opening and a second bond pad opening, wherein:

the first bond pad opening overlies the first bond pad;

the second bond pad opening overlies the second bond pad;

the passivation layer overlies first and second portions of the first and second conductive sections;

the second portion of the first conductive section lies adjacent to the first interconnect;

the first portion of the first conductive section lies further from the first interconnect compared to the second portion of the first conductive section;

the second portion of the second conductive section lies adjacent to the second interconnect;

the first portion of the second conductive section lies further from the second interconnect compared to the second portion of the second conductive section;

the first bond pad lies closer to a first side of the semiconductor device compared to the second bond pad;

the second bond pad lies closer to a second side of the semiconductor device that is opposite the first side compared to the first bond pad; and

each of the first portions is wider than each of the second portions.

5,814,894

SEMICONDUCTOR DEVICE, PRODUCTION METHOD THEREOF, AND TAPE CARRIER FOR SEMICONDUCTOR DEVICE USED FOR PRODUCING THE SEMICONDUCTOR DEVICE

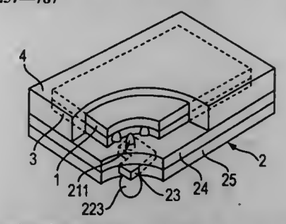
Kazumasa Igarashi; Megumu Nagasawa; Satoshi Tanigawa; Hideyuki Usui; Nobuhiko Yoshio; Hisataka Ito, and Tadao Okawa, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Apr. 4, 1996, Ser. No. 627,996

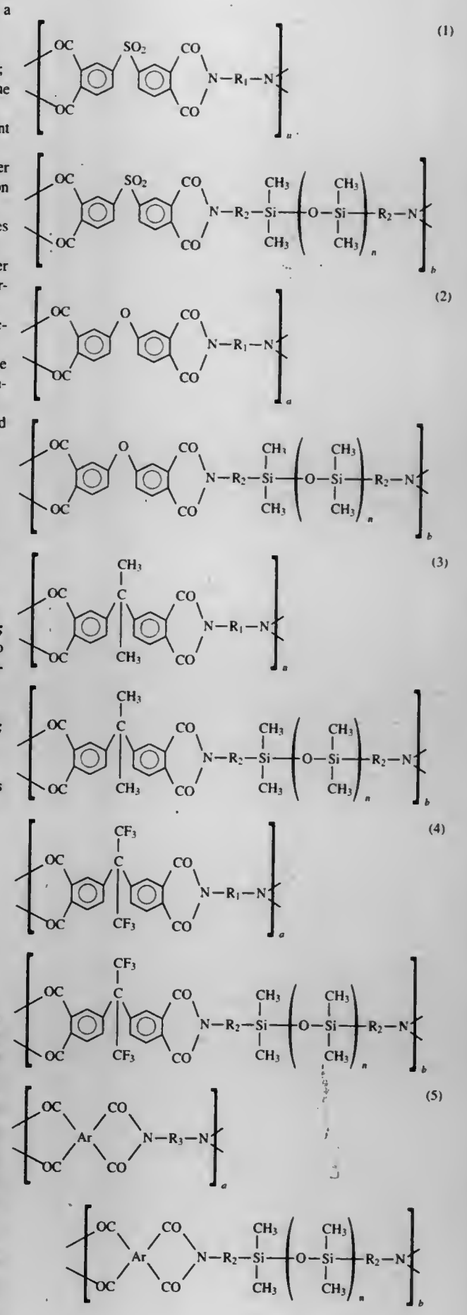
Claims priority, application Japan, Apr. 7, 1995, 7-082895; Oct. 31, 1995, 7-283642

Int. Cl.[6] H01L *23/28*

U.S. Cl. 257—787 **28 Claims**



1. A semiconductor device, wherein a semiconductor chip equipped with at least one electrode is mounted on an auxiliary wiring plate, wherein the auxiliary wiring plate has a surface to which the semiconductor chip is mounted such that the electrode side of the semiconductor chip faces the surface of the auxiliary wiring plate, at least one leading conductor is disposed in the inside of said auxiliary wiring plate, one end of the leading conductor forms an internal electrode projecting from the surface of said auxiliary wiring plate at the semiconductor chip-mounting side, the other end of the leading conductor forms an external electrode projecting from the surface of said auxiliary wiring plate at the opposite side to said semiconductor chip-mounting side, and said internal electrode is connected to the electrode of the semiconductor chip, at least a gap between the semiconductor chip and the auxiliary wiring plate being encapsulated with a heat-welding polyimide resin layer, wherein said heat-welding polyimide resin layer is formed by at least one of the heat-welding polyimides represented by the following formulae (1) to (5);



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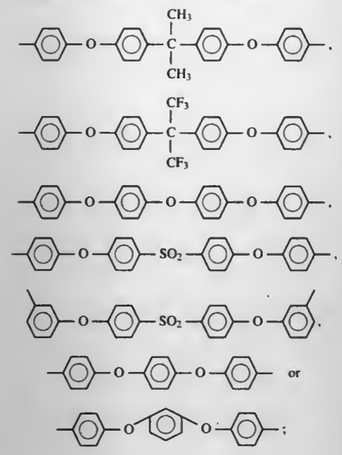
wherein in the above formulae (1) to (5), R_1 represents



R_2 represents $—C_3H_6—$, $—C_4H_8—$, or

R_3 represents an aromatic silicon-free diamine residue; Ar represents an aromatic tetracarboxylic acid residue; n represents an integer of from 1 to 100; a and b represent numbers satisfying the relationship of $a+b=1$ and the relationship of $0.3 \leqq a/(a+b) \leqq 1.00$; and the polyimide of formulae (1) to (5) may be a random copolymer or a block copolymer.

5,814,895

STATIC RANDOM ACCESS MEMORY HAVING TRANSISTOR ELEMENTS FORMED ON SIDE WALLS OF A TRENCH IN A SEMICONDUCTOR SUBSTRATE

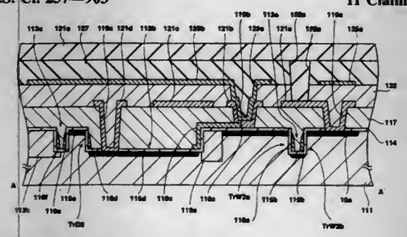
Teruo Hirayama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1996, Ser. No. 769,121

Claims priority, application Japan, Dec. 22, 1995, 7-349532; Dec. 25, 1995, 7-351052

Int. Cl.[6] H01L *27/11;29/94*

U.S. Cl. 257—903 **11 Claims**



1. A semiconductor memory comprising:

a recess formed in a semiconductor substrate;

a drain diffusion of a drive transistor formed under a surface of said recess;

a gate electrode formed around a side of the recess;

a drain diffusion of a word transistor formed under a surface of said semiconductor substrate adjacent said recess; and

a conductive structure beginning at a base of said recess extending upward to the drain diffusion of the word transistor which electrically connects the drain diffusion of the word transistor to the drain diffusion of the drive transistor.

5,814,896

STARTER WITH PINION ROTATION RESTRICTING STRUCTURE

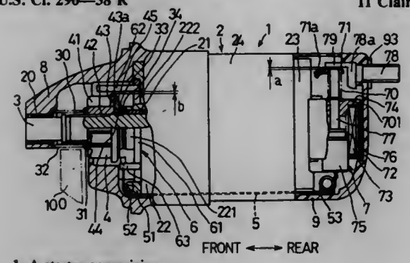
Takeshi Araki, Nishikasugai-gun, Japan, assignor to Nippondenso Co., Ltd., Kariya-city, Japan

Filed May 22, 1996, Ser. No. 651,591

Claims priority, application Japan, May 26, 1995, 7-152675; Mar. 22, 1996, 8-66020

Int. Cl.[6] F02N *11/00*

U.S. Cl. 290—38 R **11 Claims**



1. A starter comprising:

a motor;

an output shaft driven by said motor;

a pinion moving member having a pinion fitted on said output shaft through a helical spline engagement for an engagement with and a disengagement from a ring gear of an engine;

a magnet switch having a plunger movable under an electrical energization of an exciting coil, and a movable contact movable toward a fixed contact under motion of said plunger, said magnet switch performing an electrical energization for said motor under an abutment of said movable contact against said fixed contact; and

pinion restricting means for restricting rotation of said pinion through abutment to said pinion moving member by a movement of said plunger of said magnet switch and for enabling said pinion to move toward said ring gear through said helical spline,

wherein said pinion restricting means is positioned to abut said pinion moving member after said movable contact of said magnet switch is abutted against said fixed contact and before a start of rotation of said pinion moving member by said output shaft.

5,814,897

VEHICLE PASSENGER RESTRAINT SYSTEM

Koji Ito, Ama gun; Seichi Shin, Kitasouma gun, and Katsu Hattori, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 27, 1997, Ser. No. 827,115

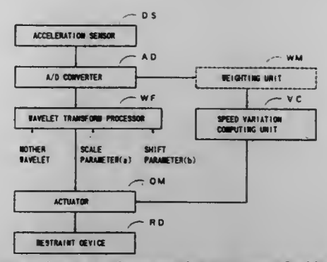
Claims priority, application Japan, Mar. 28, 1996, 8-074819; Jul. 19, 1996, 8-191057

Int. Cl.[6] B60R *21/32*

U.S. Cl. 307—10.1 **6 Claims**

1. A vehicle passenger restraint system having a restraint device for protecting a passenger in a vehicle, comprising:

acceleration sensing means for sensing an acceleration of said vehicle;



A/D converting means for converting an output of said acceleration sensing means into a digital signal indicative of the acceleration of said vehicle;

wavelet transforming means for transforming an output of said A/D converting means by a wavelet function into a wavelet coefficient, the wavelet function being provided on the basis of a mother wavelet function localized in time, scaled in response to a scale parameter, and shifted in response to a shift parameter indicative of a time localization;

speed variation computing means for setting a first condition when the wavelet coefficient transformed by said wavelet transforming means exceeds a predetermined value, and integrating the output of said A/D converting means for a predetermined period to provide a speed variation; and

actuating means for setting a second condition when the speed variation provided by said speed variation computing means exceeds a predetermined level, and actuating said restraint device when both of the first and second conditions are set.

5,814,898

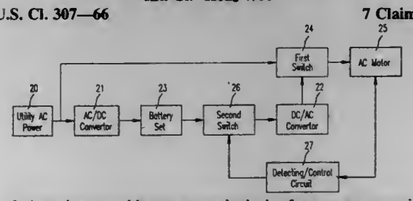
UNINTERRUPTABLE POWER SUPPLY DEVICE FOR A MOTOR

Jiann-Fuh Chen; Man-Ming Lai; Kuo-Jiann Huang, and Tian-Wen Liu, all of Taipei, Taiwan, assignors to Delta Electronics Inc., Taipei, Taiwan

Filed Feb. 28, 1997, Ser. No. 808,059

Int. Cl.[6] H02J *7/00*

U.S. Cl. 307—66 **7 Claims**



1. An uninterruptable power supply device for a motor, comprising:

a power storing device, electrically connected to a utility AC power source, wherein said utility AC power source charges said power storing device;

a DC/AC convertor, electrically connected to said power storing device, for converting a DC power outputted from said power storing device into an AC power to be used by said motor;

a first switch, electrically connected to said utility AC power source, said DC/AC convertor, and said motor, for performing a first switching operation in response to a status of said utility AC power source;

a detecting/control circuit, electrically connected to said motor, for receiving a status signal from a controller of said motor, determining a status condition of said motor, and outputting a control signal indicative of said status condition; and

a second switch, electrically connected to said detecting/control circuit, said power storing device, and said DC/AC convertor, for performing a second switching operation in response to said control signal, wherein said second switch disconnects said power storing device from said DC/AC convertor if the control signal indicates that said motor is not loading said power storing device.

5,814,899

SOI-TYPE SEMICONDUCTOR DEVICE WITH VARIABLE THRESHOLD VOLTAGES

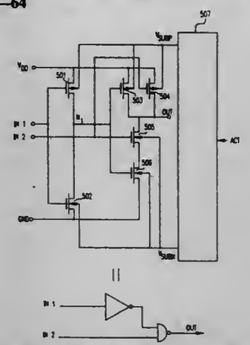
Koichiro Okumura, and Susumu Kurosawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 592,635, Jan. 26, 1996. This application Mar. 5, 1997, Ser. No. 812,974

Claims priority, application Japan, Jan. 27, 1995, 7-031348

Int. Cl.[6] G05F *1/10*

U.S. Cl. 307—64 **14 Claims**



1. A bias voltage generating apparatus, comprising:

a first power supply means for supplying first power supply voltage;

a second power supply means for supplying a second power supply voltage;

a first output terminal;

a second output terminal;

a first switching element connected between said first power supply means and said first output terminal, said first switching element being turned ON in a standby mode and being turned OFF in an active mode;

a first diode means formed by a P-channel MOS transistor and connected between said first power supply means and said first output terminal;

a second diode means formed by a PNP-type transistor and connected between said first power supply means and said first output terminal, an absolute value of a threshold voltage of said first diode means being smaller than a forward voltage of said second diode means;

a switching element connected between said first output terminal and said second power supply means, said second switching element being turned OFF in said standby mode and being turned ON in said active mode;

a third switching element connected between said second output terminal and said second power supply means, said third switching element being turned ON in said standby mode and being turned OFF in said active mode;

a third diode means formed by an N-channel MOS transistor and connected between said second output terminal and said second power supply means;

a fourth diode means formed by an NPN-type transistor and connected between said second output terminal and said second power supply means, a threshold voltage of said third diode means being smaller than a forward voltage of said fourth diode means; and

a fourth switching element connected between said first power supply means and said second output terminal, said fourth switching element being turned OFF in said standby mode and being turned ON in said active mode.

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5,814,900

DEVICE FOR COMBINED TRANSMISSION OF ENERGY AND ELECTRIC SIGNALS

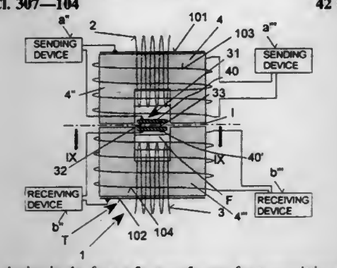
Albert Esser, Schenectady, N.Y., and Ulrich Schwan, Salem-Beuren, Germany, assignors to Ulrich Schwan, Salem-Beuren, Germany

Continuation-in-part of Ser. No. 922,191, Jul. 30, 1992, abandoned. This application Nov. 25, 1994, Ser. No. 345,202

Claims priority, application Germany, Jul. 30, 1991, 41 25 145.8

Int. Cl.[6] H04B *5/00*

U.S. Cl. 307—104 **42 Claims**



1. A device in the form of a transformer for transmitting electrical energy, said device comprising:

a core of a ferromagnetic material;

a primary coil and a secondary coil wound about said core;

a receiving electronic device and a sending electronic device;

at least one first areal antenna and at least one second areal antenna in direct vicinity of said primary and said secondary coils for a contact-free transmitting of changing signals, said at least one first and at least one second areal antennas connected interchangeably to said receiving electronic device and said sending electronic device to serve as a receiver and a sender, respectively, with said receiver and said sender forming a unit with said primary coil, said secondary coil, and optionally said core.

5,814,901

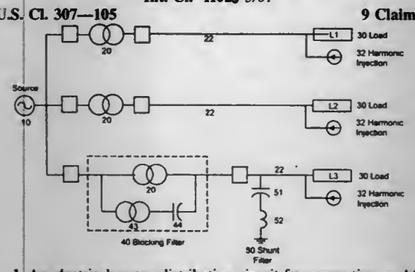
HARMONIC BLOCKING AT SOURCE TRANSFORMER

Satoru Ihara, Burnt Hills, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Jul. 14, 1997, Ser. No. 892,289

Int. Cl.[6] H02J *3/01*

U.S. Cl. 307—105 **9 Claims**



1. An electrical power distribution circuit for connecting an AC source of electrical power to a non-linear load having a harmonic current of at least one harmonic frequency, comprising:

a source transformer having an input connected to said AC source and an output connected to the non-linear load, said source transformer having an MVA rating and an impedance; and

a series circuit comprising an auxiliary transformer and a capacitor connected in series, said series circuit being connected in parallel with said source transformer forming a blocking filter, said blocking filter having a resonant frequency sufficiently matching that of a frequency of the harmonic current to provide impedance for attenuating substantially all of the harmonic current.

5,814,902

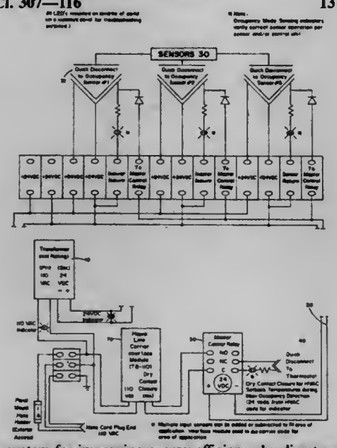
SYSTEM AND PROCESS FOR CONTROL OF ENERGY USE BY DIRECT OBSERVATION OF OCCUPANCY

Dennis R. Creasy; Paul Kropfeld; Gene Mauk, and Dana Schmidt, all of Baltimore, Md., assignors to Light Minder, Baltimore, Md.

Filed Aug. 22, 1996, Ser. No. 701,751

Int. Cl.[6] G08B *13/00*

U.S. Cl. 307—116 **13 Claims**



1. A system for improving energy efficiency by direct sensing of occupancy of discrete suites within multisuite facilities, such as hotels, that have a plurality of discrete occupancy suites, the system comprising: a discrete energy control system within each suite, each discrete energy control system comprising: a power supply; a plurality of occupancy sensors for providing at least two different types of occupancy sensing; a first thermostat with set-back control means responsive to a predetermined signal; a plurality of electrical outlet receptacles and/or switches having an on off means responsive to a second predetermined signal; and a central interface unit for receiving signals from the occupancy sensors and, based on the signals received from the occupancy sensors determining whether the suite is occupied and based on this determination, generating said first and second predetermined signals to control the setback control means of the thermostat and on-off means of the plurality of electrical outlet receptacles respectively throughout the entire suite.

5,814,903

PROGRAMMABLE GAIN FOR SWITCHED POWER CONTROL

Keng Chih Wu, North Brunswick, N.J., assignor to Lockheed Martin Corporation, East Windsor, N.J.

Filed Sep. 13, 1996, Ser. No. 713,621

Int. Cl.[6] H02J *3/08*

U.S. Cl. 307—125 **11 Claims**

1. A spacecraft, comprising:

a payload which consumes electrical power when in use;

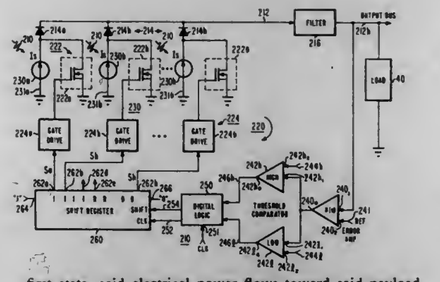
a solar power generator for producing electrical power in response to insolation;

switch means coupled with said solar power generator and said payload, for controllably coupling said solar power generator with said payload, so that when said switch means assumes a first state, said electrical power flows toward said payload, and when said switch means assumes a second state, said electrical power is blocked from flowing to said payload;

controllable clock signal generating means for generating a clock signal, and responsive to a clock control signal for generating said clock signal at one of at least first and second different rates;

control means coupled to said switch means, to said payload, and to said clock signal generating means, for controlling said state of said switch means at a rate of said clock signal, to thereby form a feedback loop in a manner which controls said electrical power flowing toward said payload in a manner which tends to maintain a predetermined value of an electrical characteristic at said payload, whereby said feedback loop assumes an unstable condition in which it may not maintain said predetermined value in the face of changes in said insolation;

electrical characteristic sensing means coupled to said controllable clock signal generates means and to one of said payload and said solar power generator, for sensing an electrical characteristic of said one of said solar power generator and said payload, and for generating said clock control signal in a manner which selects among said clock rates to improve said unstable condition.



5,814,904

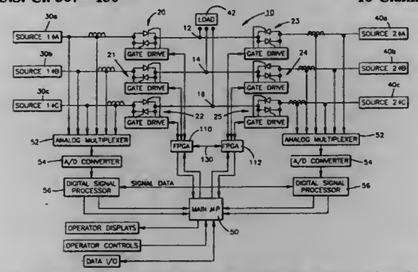
STATIC SWITCH METHOD AND APPARATUS

James M. Galm, Shaker Heights, Ohio, assignor to Cyberex, Inc., Mentor, Ohio

Continuation-in-part of Ser. No. 412,067, Mar. 28, 1995, Pat. No. 5,644,175. This application Dec. 5, 1996, Ser. No. 759,572

Int. Cl.[6] H01H *35/00*

U.S. Cl. 307—130 **10 Claims**



1. A method for providing alternate current paths to a junction through gate controlled current carrying devices wherein each of said current carrying devices within a set of such devices blocks current flow in one direction and selectively allows current flow in an opposite direction when a gate to said devices is activated, said method comprising the steps of:

a) initiating a switch away from a first current path through a first, active device set of two or more current carrying devices to a second current path through a second, inactive device set of two or more current carrying devices by removing a current sustaining gate signal from the current carrying devices of the first device set;

b) sensing a current status of the devices of the first, active device set to determine a current carrying status of said devices by monitoring a voltage across the first device set;

c) if the voltage falls within a specified range designating at least one of the devices that make up the active device set as being current carrying and otherwise designating the active device set as being blocking current in both directions;

d) again sensing a voltage across the devices of the first device set to confirm the current carrying status of said devices; and

e) if the current carrying state of said devices in the first device set is confirmed in step d to be in the same state sensed in step c, and the device set is not blocking current in both directions, gating one gate controlled device in a second, inactive set of said gate controlled devices to enable current flow in one direction through said one gate controlled device of the second, inactive device set.

5,814,905

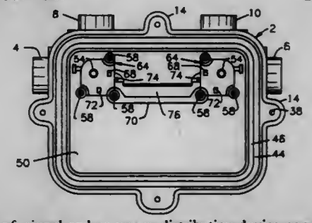
CABLE TV MULTI-TAP WITH UNINTERRUPTABLE SIGNAL/POWER THROUGHPUT

Danny Q. Tang, 2 Taylorr Lake Ct., Manalapan, N.J. 07726

Continuation of Ser. No. 489,726, Jun. 13, 1995, Pat. No. 5,677,578. This application Aug. 25, 1997, Ser. No. 918,012

Int. Cl.[6] H01B *7/30*

U.S. Cl. 307—147 **14 Claims**



1. An r.f. signal and ac power distribution device comprising:

a main housing having a bottom, sides, and an open top portion;

a housing cover for installation on the top of said main housing to provide closure thereof, said housing cover having top and bottom face portions;

a printed circuit board mounted on the bottom of said housing cover, including:

circuitry including means for conducting r.f. signals and ac power;

an input electrical connection post for receiving a main r.f. signal and ac power, and

an output electrical connection post for outputting said main r.f. signal and ac power after passing through said circuitry;

is input and output seizure socket assemblies mounted in spaced relation inside the top portion of said main housing, for receiving said input and output electrical connection posts, respectively, for electrically connecting the posts to input and output main r.f. cables, respectively;

electrically conducive means mounted between said input and output seizure socket assemblies; and

said input and output seizure socket assemblies further including first and second switching means, respectively, each responsive to said cover and printed circuit board being removed from said main housing for electrically connecting said input and output seizure socket assemblies to said electrically conductive means just before said input and output electrical connection posts are electrically disconnected from said input and output seizure socket assemblies, for providing an uninterruptable electrical connection between said input and output seizure socket assemblies, and input and output cables connected thereto, respectively.

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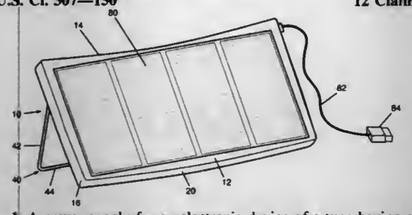
5,814,906

POWER SUPPLY FOR PORTABLE COMPUTERS AND OTHER ELECTRONIC DEVICES

Jerald C. Spencer, 212 7th Ave., and Steven D. Marquis, 1419 Boulder Ave., both of Helena, Mont. 59601

Filed Dec. 9, 1996, Ser. No. 762,327
Int. Cl.[6] H01L *31/045*
U.S. Cl. 307—150 **12 Claims**



1. A power supply for an electronic device of a type having an integral external housing within which the electronic components of the device are encased, the power supply comprising:

a mounting panel having a front surface and a back surface;

attachment means disposed on the mounting panel to permit temporary attachment of the power supply to the housing of an electronic device, and to permit a detachment of the power supply from the housing of an electronic device;

wherein the back surface of the mounting panel faces toward the electronic device housing when the power supply is attached to the housing of the electronic device;

a solar panel attached to the mounting panel and facing away from the electronic device when the power supply is attached to the housing of the electronic device; wherein the solar panel is capable of producing an electrical power output through the conversion of solar energy to electrical energy;

support means attached to the power supply for selectively positioning the power supply into an upright inclined position and for maintaining the power supply in the inclined position when the power supply is detached from the housing of an electronic device, wherein the power supply when detached from the housing can be selectively placed for maximum solar exposure while remaining electrically connected to the electronic device through the power transmission means;

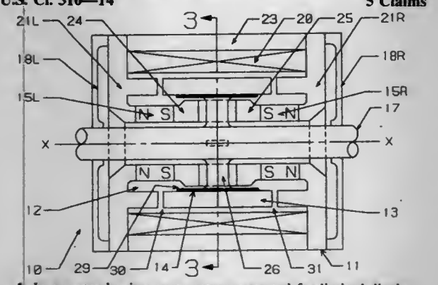
power transmission means including connection means to detachably connect the power supply to an electronic device thereby transmitting power; whereby, upon detachment of the connection means power transmission is ceased.

5,814,907

ELECTROMAGNETIC FORCE MOTOR WITH INTERNAL EDDY CURRENT DAMPING

Pablo Bandera, Buffalo, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed May 5, 1997, Ser. No. 851,950
Int. Cl.[6] H02K *41/00*
U.S. Cl. 310—14 **5 Claims**



1. In a motor having an armature mounted for limited displacement relative to a body, having a high reluctance permanent magnet, and having an electromagnetic coil, said body and armature being adapted to conduct magnetic flux, said armature defining with said body a plurality of variable-reluctance working air gaps and at least one constant-reluctance non-working air gap, each of said working air gaps containing a net flux that is the algebraic sum of a flux attributable to said magnet and a flux attributable to said coil, said non-working air gap containing only flux attributable to said magnet, the improvement which comprises:

a current-conducting member attached to said armature and arranged to move in said non-working air gap in a direction having a component substantially perpendicular to the flux therein such that eddy currents will be induced in said member to damp the velocity of said armature;

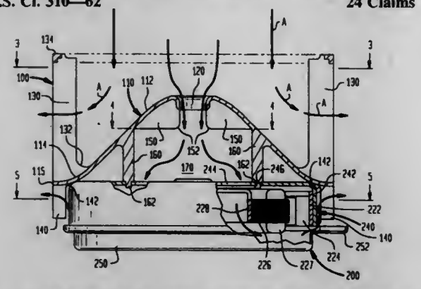
the elements of said motor being so configured and arranged that said eddy currents are a function of the velocity of said armature relative to said body, but are not a function of changes in the flux attributable to said coil or attributable to the position of said armature relative to said body.

5,814,908

BLOWER WHEEL WITH AXIAL INLET FOR VENTILATION

Jerzy Muszynski, London, Canada, assignor to Siemens Electric Limited, Mississauga, Canada

Filed Apr. 30, 1996, Ser. No. 641,388
Int. Cl.[6] F04D *25/08;* **H02K** *9/04;9/06*
U.S. Cl. 310—62 **24 Claims**



1. An apparatus for providing ventilating air into a housing for an electric machine, which comprises:

a hub having a center portion and a generally circular outer portion forming an outer surface, the center portion defining a longitudinal axis and having a ventilation aperture extending therethrough in general alignment with the longitudinal axis and being dimensioned to permit air to pass through the center portion;

a first plurality of blades extending upwardly from the outer portion of the hub;

a second plurality of blades extending downwardly from the outer portion of the hub; and

mounting means adapted for mounting the hub to the housing;

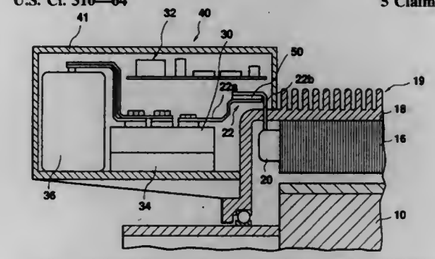
wherein air is communicated through the ventilation aperture in the center portion of the hub, the first plurality of blades being adapted to guide air at least partially toward the outer surface of the hub and at least partially into the ventilation aperture and the second plurality of blades being adapted to transmit air through the housing.

5,814,909

ELECTRIC MOTOR HAVING HEAT RADIATOR AT ELECTRIC CONNECTION WITH INVERTER

Eiji Yamada, Owariasahi; Takao Miyatani, Toyota, and Yasutomo Kawabata, Aichi-ken, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 19, 1995, Ser. No. 492,136
Claims priority, application Japan, Aug. 8, 1994, 6-185875
Int. Cl.[6] H02K *11/00;5/00*
U.S. Cl. 310—64 **5 Claims**



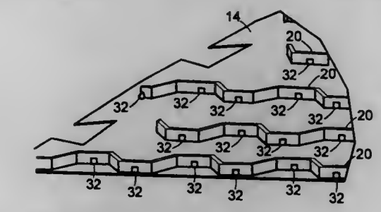
1. An electric motor having an inverter and motor coils electrically connected to the inverter, electric power being supplied from said inverter to said motor coils, said electric motor comprising two conductors respectively connected to said motor coils and inverter, said two conductors being electrically connected to each other through an electrically conductive member having a heat conductivity lower than that of said conductors, thereby transmitting electric power from said inverter to said motor coils through said conductors and conductive member.

5,814,910

COOLING VANES FOR ROTATING ELECTRIC MACHINERY

Dominic Pelletier, Pepperell, Mass., assignor to Eldim, Inc., Woburn, Mass.

Filed Sep. 6, 1995, Ser. No. 524,187
Int. Cl.[6] H02K *1/32;15/02*
U.S. Cl. 310—65 **17 Claims**



1. A stator element comprising:

a stator plate; and

a plurality of cooling vanes,

each said cooling vane comprising a corrugated thermally conductive ribbon and a plurality of projection points positioned along one edge of said ribbon,

each said ribbon being oriented radially with respect to the stator plate and welded to said stator plate at said projections,

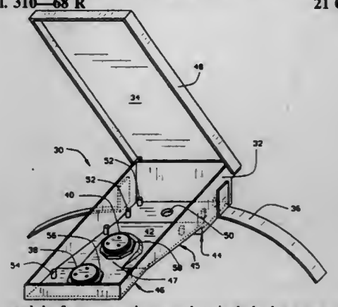
each of said projections being located at a location on said stator plate without holes.

5,814,911

MODULE AND METHOD FOR CONNECTING TIMER TO AN ELECTRIC MOTOR

Nicholas R. Daniels, Dellwood, Mo., assignor to Emerson Electric Co., St. Louis, Mich.

Filed Aug. 8, 1996, Ser. No. 695,167
Int. Cl.[6] H02K *11/00*
U.S. Cl. 310—68 R **21 Claims**



1. A module for connecting an electrical device to an electric motor, the motor having a power connector for mating with a power source connector to energize the motor, the module comprising:

an input connector configured for mating with the power source connector;

an output connector configured for mating with the motor power connector; and

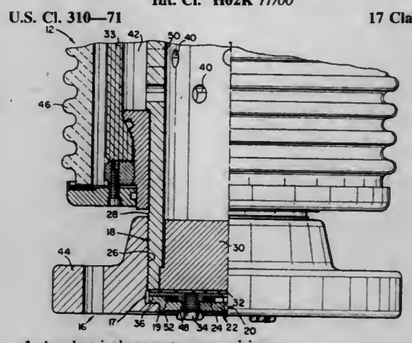
a support for the electrical device, the support having an exterior surface and the input connector and the output connector being rigidly secured to the support exterior surface.

5,814,912

ELECTRICAL LEAD BUSHING FOR A TURBINE GENERATOR

Christopher Woodrow Ross, P.O. Box 1614, Goldenrod, Fla. 32733

Filed Mar. 17, 1997, Ser. No. 819,432
Int. Cl.[6] H02K *11/00*
U.S. Cl. 310—71 **17 Claims**



1. An electrical generator, comprising:

a main electrical lead that conducts electrical current produced by the generator and that comprises a substantially cylindrical shape that has an external circumference and an end;

an electrical conductor that conducts electrical current produced by the generator and is in electrical contact with the main electrical lead and that comprises a flange shape having an inner face that covers the end of the main electrical lead;

a mechanical connector that electrically connects the electrical conductor to the external circumference of the main electrical lead, wherein the mechanical connector comprises a threaded

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portion of an interior of the flange and a threaded portion of the external circumference of the main electrical lead that can be mated with the threaded portion of the interior of the flange; and

a spring mechanism that exerts a force on the mechanical connector to maintain electrical contact between the conductor and the main electrical lead during operation of the generator and that is disposed between the end of the main electrical lead and the inner face of the conductor.

5,814,913

MULTISHAFT ELECTRIC MOTOR AND POSITIVE-DISPLACEMENT PUMP COMBINED WITH SUCH MULTISHAFT ELECTRIC MOTOR

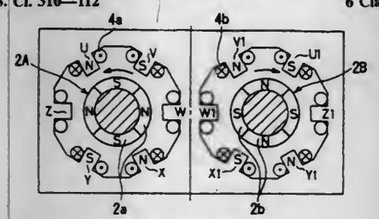
Yoshinori Ojima, Fujisawa; Kozo Matake, Kawasaki; Genichi Sato, Chigasaki; Yasushi Hisabe, Samukawa-machi; Masami Nagayama, Fujisawa; Katsuaki Usui, and Hiroaki Ogamino, both of Kawasaki, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,872

Claims priority, application Japan, Apr. 21, 1994, 6-082969; Sep. 22, 1994, 6-254693; Mar. 15, 1995, 7-083319

Int. Cl.[6] H02K *7/20;17/44;19/38*

U.S. Cl. 310—112 **6 Claims**



1. A multishaft electric motor comprising:

a plurality of juxtaposed rotors, each of the plurality of juxtaposed rotors including an axis and a permanent magnet; and

a plurality of sets of armature elements disposed fully circumferentially around said rotors for generating spatially moving magnetic fields for rotating the rotors, respectively, said permanent magnets of adjacent two of said rotors having a plurality of pairs of unlike magnetic poles for magnetically coupling the rotors through said armature elements between the permanent magnets to rotate the rotors in opposite directions;

wherein when said adjacent two of the rotors are to be driven, said armature elements of said adjacent two of the rotors are energized to generate the spatially moving magnetic fields such that the armature elements in symmetric positions with respect to a central plane lying intermediate the respective axes of said adjacent two of the rotors produce unlike magnetic poles to strengthen magnetic coupling produced by said permanent magnets.

5,814,914

ELECTRIC MOTOR OR GENERATOR

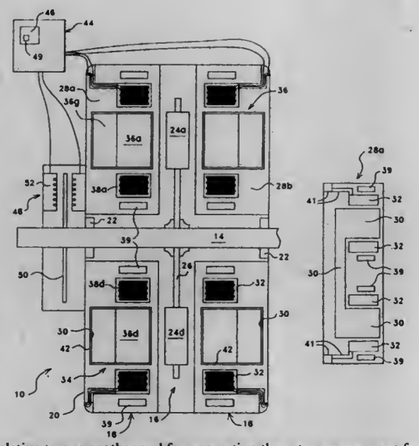
Ramon A. Caamaño, 6450 Mt. Madonna Rd., Gilroy, Calif. 95020

Continuation of Ser. No. 774,946, Dec. 27, 1996, Pat. No. 5,731,649. This application Nov. 3, 1997, Ser. No. 963,290

Int. Cl.[6] H02K *21/12;37/12*

U.S. Cl. 310—216 **28 Claims**

1. A device selected from the group of devices consisting of an electric motor, an electric generator, and a regenerative electric motor, the device including a rotor arrangement, at least one stator arrangement, and a device housing for supporting the rotor arrangement and the stator arrangement in predetermined positions



relative to one another and for supporting the rotor arrangement for rotation along a predetermined rotational path about a given rotor axis, the stator arrangement comprising:

a) at least one energizable electromagnet assembly including an overall amorphous metal magnetic core and electric coil array which together define at least one magnetic pole piece, the overall amorphous metal magnetic core being made up of a plurality of individually formed amorphous metal core pieces, wherein at least one of the amorphous metal core pieces has a shape selected from a group of a circular disk, an egg shape, a triangle having rounded corners, a trapezoid having rounded corners, an oval, a C-shape, a U-shape, and said amorphous metal core pieces cooperating with one another in forming part of said electromagnet assembly; and

b) a dielectric electromagnet housing for supporting the electromagnet assembly such that the magnetic pole pieces are positioned adjacent the rotational path of the rotor arrangement, the dielectric electromagnet housing having core piece openings formed into the electromagnet housing for holding the individually formed amorphous metal core pieces in positions adjacent to one another so as to form the overall amorphous metal magnetic core.

5,814,915

BRUSH GEAR FOR AN ELECTRIC MOTOR

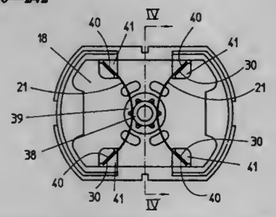
Patrick Shui-Chung Wang, Repulse Bay, Hong Kong, assignor to Johnson Electric S.A., Switzerland

Filed Oct. 4, 1996, Ser. No. 720,945

Claims priority, application United Kingdom, Oct. 6, 1995, 9520389

Int. Cl.[6] H02K *13/10*

U.S. Cl. 310—242 **17 Claims**



1. A brush for a miniature electric motor, comprising:

an elongate flexible substrate;

a flexible conductive layer formed on the substrate and having a contact portion for making sliding contact with a commutator; and

holder means for supporting the substrate in position to allow the contact portion to make contact with the commutator, the holder means including two mounting plates fixed to longitudinal ends of the substrate and arranged to be rigidly mounted to a brush gear support plate.

5,814,916

METHOD OF MANUFACTURING A PIEZOSENSITIVE MATERIAL OR A MAGNETIC MATERIAL

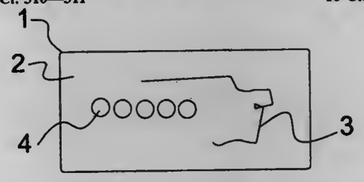
Corinne C Dejugnac, La Seyne/Mer; Alain A Scarpitta, Toulon, and Michel M Boisrayon, Le Beausset, all of France, assignors to Etat Francais Represented by the Delegue General, Paris, France

Filed Jan. 15, 1997, Ser. No. 783,328

Claims priority, application France, Jan. 15, 1996, 96 00368

Int. Cl.[6] H01L *41/18*

U.S. Cl. 310—311 **10 Claims**



1. A plurality of particles wherein at least one of the plurality of particles comprises dehydrated microorganisms contained within an envelope made of at least one of a piezosensitive material and a magnetic material.

5,814,917

SURFACE ACOUSTIC WAVE EQUIPMENT

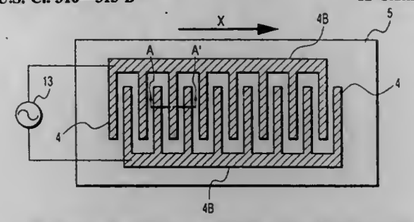
Atsushi Isobe, Kodaira; Mitsutaka Hikita; Chisaki Takubo, both of Hachioji, and Kengo Asai, Kokubunji, all of Japan, assignors to Hitachi Media Electronics Co., Ltd., Iwate-ken, Japan

Filed Jul. 10, 1996, Ser. No. 676,683

Claims priority, application Japan, Jul. 11, 1995, 7-174859

Int. Cl.[6] H01L *41/04*

U.S. Cl. 310—313 B **12 Claims**



1. A surface acoustic wave transducer having an interdigital transducer mounted on a surface of a θ rotated Y cut lithium niobate single crystal piezoelectric substrate, wherein a principal ingredient of said interdigital transducer is aluminum, the direction of said interdigital transducer is parallel to the X-axis of the lithium niobate single crystal, and a cut angle θ of said piezoelectric substrate, a film thickness h of electrode fingers of said interdigital transducer and a pitch P of said electrode fingers have the following relationship:

$$(\theta+5)^2/300+11/12 \leq h/P \times 100-8 \leq -0.0001\times(\theta+5)^3+0.1625\times(\theta+5)+5.5$$

and

$$-30 \leq \theta \leq 20.$$

5,814,918

DIAMOND-ZNO SURFACE ACOUSTIC WAVE DEVICE

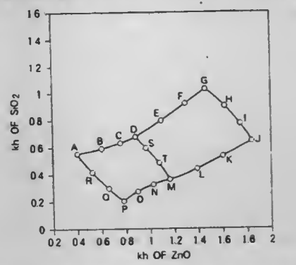
Hideaki Nakahata; Kenjiro Higaki; Satoshi Fujii; Hiroyuki Kitabayashi, and Shinichi Shikata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Aug. 7, 1996, Ser. No. 689,296

Claims priority, application Japan, Aug. 8, 1995, 7-202114

Int. Cl.[6] H03H *9/145;* **H01L** *41/08*

U.S. Cl. 310—313 R **10 Claims**



1. A surface acoustic wave device for 2nd mode surface acoustic wave of a wavelength λ (μm) comprising:

(i) a diamond layer,

(ii) a ZnO layer formed on said diamond layer, said ZnO layer having a thickness t_z,

(iii) an interdigital transducer (IDT) formed on said ZnO layer, and

(iv) a SiO_2 layer formed over said interdigital transducer onto said ZnO layer, said SiO_2 layer having a thickness of t_s;

wherein a parameter $kh_z=(2\pi/\lambda)t_z$ and a parameter $kh_s=(2\pi/\lambda)t_s$ are given within a region A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-A in a two-dimensional Cartesian coordinate graph having abscissa axis of kh_z and ordinate axis of kh_s,

the outer edge of said region A-B-C-D-E-F-G-H-I-J-K-L-M-N-O-P-Q-R-A being given by a closed chain in said Cartesian coordinate consisting of points A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q and R and lines A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-I, I-J, J-K, K-L, L-M, M-N, N-O, O-P, P-Q, Q-R and R-A;

said point A being given by a coordinate point (kh_z=0.4, kh_s=0.55);

said point B being given by a coordinate point (kh_z=0.6, kh_s=0.6);

said point C being given by a coordinate point (kh_z=0.75, kh_s=0.63);

said point D being given by a coordinate point (kh_z=0.88, kh_s=0.68);

said point E being given by a coordinate point (kh_z=1.1, kh_s=0.8);

said point F being given by a coordinate point (kh_z=1.3, kh_s=0.93);

said point G being given by a coordinate point (kh_z=1.47, kh_s=1.03);

said point H being given by a coordinate point (kh_z=1.61, kh_s=0.92);

said point I being given by a coordinate point (kh_z=1.75, kh_s=0.77);

said point J being given by a coordinate point (kh_z=1.82, kh_s=0.64);

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said point K being given by a coordinate point (kh_z=1.6, kh_y=0.54);

said point L being given by a coordinate point (kh_z=1.41, kh_y=0.42);

said point M being given by a coordinate point (kh_z=1.19, kh_y=0.35);

said point N being given by a coordinate point (kh_z=1.03, kh_y=0.32);

said point O being given by a coordinate point (kh_z=0.92, kh_y=0.28);

said point P being given by a coordinate point (kh_z=0.8, kh_y=0.2);

said point Q being given by a coordinate point (kh_z=0.66, kh_y=0.3); and

said point R being given by a coordinate point (kh_z=0.53, kh_y=0.42).

5,814,919

ELECTRO-MECHANICAL ENERGY CONVERSION ELEMENT AND A VIBRATION WAVE ACTUATOR USING THE ELECTRO-MECHANICAL ENERGY CONVERSION ELEMENT

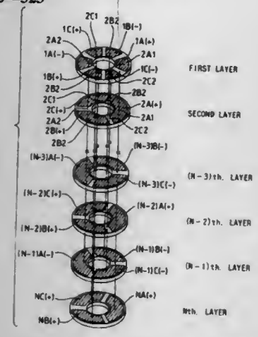
Ichiro Okumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Toyko, Japan

Filed Apr. 23, 1996, Ser. No. 636,466

Claims priority, application Japan, Apr. 28, 1995, 7-106041; Aug. 31, 1995, 7-223220

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—323 **29 Claims**



1. A stack type energy conversion element comprising:

a first electro-mechanical energy conversion element having a plurality of driving electrodes as a first group, all areas of said first electro-mechanical energy conversion element corresponding to said plurality of driving electrodes being polarized in a first direction; and

a second electro-mechanical energy conversion element having a plurality of driving electrodes as a second group, all areas of said second electro-mechanical energy conversion element corresponding to said plurality of driving electrodes being polarized in a second direction inverse to the first direction,

said first and second electro-mechanical energy conversion elements being stacked such that phases of said plurality of driving electrodes of said first group are shifted relative to phases of said plurality of driving electrodes of said second group.

5,814,920

PIEZOELECTRIC/ELECTROSTRICTIVE FILM-TYPE ELEMENT AND METHOD FOR PRODUCING THE SAME

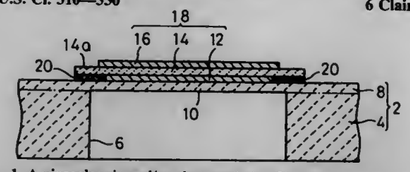
Yukihisa Takeuchi, Nishikamo-gun; Tsutomu Nanataki, Toyoake; Koji Kimura, Nagoya, and Nobuo Takahashi, Owariasahi, all of Japan, assignors to NGK Insulators Ltd., Japan

Filed Dec. 23, 1996, Ser. No. 777,953

Claims priority, application Japan, Dec. 28, 1995, 7-342414

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—330 **6 Claims**



1. A piezoelectric and/or electrostrictive film-type element having at least one hollow space and comprising a zirconia substrate with a thin-walled diaphragm section provided integrally to cover and close said hollow space, and a film-shaped piezoelectric and/or electrostrictive operating section composed of a lower electrode, a piezoelectric and/or electrostrictive layer, and an upper electrode which are successively provided in a layered configuration on an outer surface of said diaphragm section in accordance with a film-forming method, wherein:

at least a part of a peripheral edge portion of said piezoelectric and/or electrostrictive layer extends laterally beyond a corresponding peripheral edge portion of said lower electrode to construct an overhang section located opposingly over said diaphragm section, and said overhang section is in an incomplete connection state with respect to a partial region of said diaphragm section located just thereunder by the aid of particles principally comprising a compound of alumina and magnesia allowed to intervene between said overhang section and said partial region of said diaphragm section located just thereunder.

5,814,921

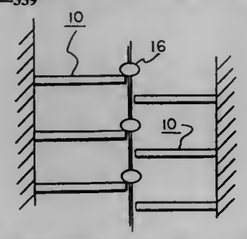
FREQUENCY MULTIPLYING PIEZOELECTRIC GENERATORS

Charles B. Carroll, Trenton, N.J., assignor to Ocean Power Technologies, Inc., West Trenton, N.J.

Filed Mar. 13, 1995, Ser. No. 404,186

Int. Cl.[6] H01L *41/08;* **F03C** *2/08*

U.S. Cl. 310—339 **11 Claims**



1. A system for generating electrical energy comprising a first array of piezoelectric power generating elements spaced apart along a first direction, a second array of spaced apart engaging means, means for supporting said arrays in operative relationship to one another, means for causing relative movements between said arrays for causing said engaging means to move relative to said elements along said first direction for causing successive engagements of each of said engaging means with successive ones of said elements along said first direction for causing straining of and the generation of electrical energy by said elements, means for providing synchronous engagements of said engaging means with said elements, said first array of elements including first and second groups of elements, said second array of engaging means including first and second groups of engaging means, and said synchronous means causing all the engaging means of said first group of, engaging means to simultaneously engage respective ones of said first group of elements during a first time period and causing all the engaging means of said second group of engaging means to simultaneously engage respective ones of said group of elements during a second time period different from said first time period.

5,814,922

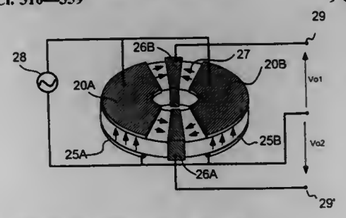
ANNULAR PIEZOELECTRIC TRANSFORMER

Kenji Uchino, and Burhanettin Koc, both of State College, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Nov. 18, 1997, Ser. No. 972,942

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—359 **9 Claims**



1. A piezoelectric transformer comprising:

a piezoelectric material in a form of an annulus with opposed major surfaces bounding a thickness dimension, said annulus comprising at least a first segment and a second segment, said first segment bounded by a first electrode and a second electrode, and said second segment bounded by a third electrode and a fourth electrode, said first electrode and third electrode positioned on a common major surface and said second electrode and fourth electrode positioned on a common major surface, each segment comprising a circumferential extent of less than 180° of said annulus, each said first segment and second segment polled across said thickness dimension, and at least a third segment positioned between opposed ends of said first segment and second segment and polled in a direction generally tangential to said annulus, said third segment including a fifth electrode;

means for applying to electrodes bounding said first segment and said second segment, an input signal which excites said piezoelectric material to resonate at a resonant frequency thereof; and

means for sensing an output signal from said fifth electrode.

5,814,923

PIEZOELECTRIC THIN-FILM DEVICE, PROCESS FOR PRODUCING THE SAME, AND INK JET RECORDING HEAD USING SAID DEVICE

Masato Shimada, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP95/02721, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO96/20503, PCT Pub. Date Jul. 4, 1996

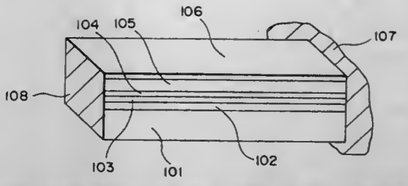
PCT Filed Dec. 27, 1995, Ser. No. 696,914

Claims priority, application Japan, Dec. 27, 1994, 6-325633

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—800 **10 Claims**

1. A piezoelectric thin-film device comprising: a piezoelectric film of a polycrystalline material; and two electrodes, the piezoelectric film being sandwiched between the two electrodes,



wherein the piezoelectric film comprises a three-component composition comprising a two-component PZT constituent containing 5% by mole or more of a third component, said piezoelectric film having a thickness of not more than 5 μm, and having A lead content substantially uniformly distributed in a thickness direction of the film which varies by less than ±5%.

5,814,924

FIELD EMISSION DISPLAY DEVICE HAVING TFT SWITCHED FIELD EMISSION DEVICES

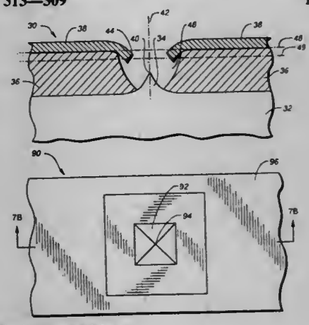
Hiroshi Komatsu, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 129,991, Sep. 30, 1993, Pat. No. 5,448,132, which is a continuation of Ser. No. 73,149, Jun. 3, 1993, Pat. No. 5,412,285, which is a continuation of Ser. No. 790,281, Nov. 7, 1991, abandoned, which is a continuation of Ser. No. 624,424, Dec. 6, 1990, abandoned. This application Jun. 1, 1995, Ser. No. 457,177

Claims priority, application Japan, Dec. 18, 1989, 1-327621; Nov. 20, 1990, 2-315472

Int. Cl.[6] H01J *1/30*

U.S. Cl. 313—309 **15 Claims**



1. A display, comprising:

a conductive layer;

a substantially planar insulating layer disposed on said first conductive layer, said insulating layer defining a plurality of openings therein;

an anode separated from and opposing said insulating layer;

a field emission device formed at each of the insulator layer openings, each field emission device comprising:

a gate electrode disposed on said insulating layer circumferentially about a corresponding one of the insulator layer openings;

a cathode disposed within the corresponding insulator opening extending from said conductive layer towards said gate electrode, said cathode including a tapered cathode tip aligned radially inward of said gate electrode; and

a thin-film transistor disposed on said insulating layer proximate the gate electrode, comprising:

a source region coupled to a source line;

a drain region coupled to said gate electrode; and

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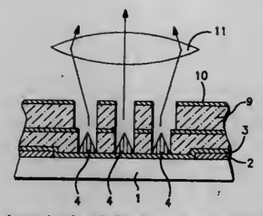
a gate coupled to a gate line to selectively activate said transistor and control anode current flow in accordance with data signals applied on the source line.

5,814,925
ELECTRON SOURCE WITH MICROTIP EMISSIVE CATHODES
Yoshinori Tomihari, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Sep. 22, 1995, Ser. No. 532,985
Claims priority, application Japan, Sep. 26, 1994, 6-229415
Int. Cl.[6] H01J *1/30*
U.S. Cl. 313—309 **9 Claims**

4. An emissive electron source comprising:
an insulating substrate;
a first electrode formed on the insulating substrate and shaped as an intersecting web of linear segments;
a resistive coating covering the first electrode and the substrate;
an insulating layer disposed on the resistive coating, the insulating layer having a plurality of apertures therethrough;
a second electrode disposed on the insulating layer, the second electrode having apertures disposed therethrough in alignment with the apertures of the insulating layer; and
a plurality of conical cathodes, one of the plurality of conical cathodes being disposed upon the resistive coating within each of the apertures of the insulating layer;
wherein the plurality of conical cathodes are disposed with respect to the intersecting linear segments of the first electrode such that each of the conical cathodes is equidistant from a respective nearest point of the first electrode.

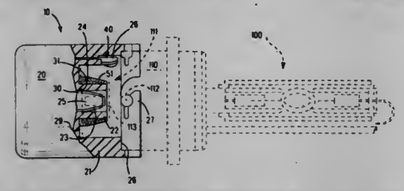
5,814,926
ELECTRON EMISSION DEVICE WITH OFFSET CONTROL ELECTRODE
Yoshinori Tomihari, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 25, 1995, Ser. No. 547,879
Claims priority, application Japan, Oct. 28, 1994, 6-265044
Int. Cl.[6] H01J *1/30*
U.S. Cl. 313—309 **5 Claims**

1. An electron emission device comprising:
a plurality of protruding cathodes formed on a substrate;
a first electrode placed above said cathodes on a first insulating layer; and



a second electrode placed above said first electrode on a second insulating layer, centers of second openings of said second electrode being offset from centers of first openings of said first electrode.

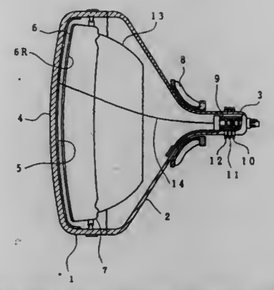
5,814,927
SOCKET FOR AUTOMOTIVE DISCHARGE LAMPS
Ping Chen, Nagoya, Japan, assignor to The Whitaker Corporation, Wilmington, Del.
Filed Apr. 24, 1997, Ser. No. 842,452
Claims priority, application Japan, May 30, 1996, 8-206681
Int. Cl.[6] H01R *33/00*
U.S. Cl. 313—318.03 **19 Claims**



11. A socket for use with a discharge lamp: the socket comprising a molded insulating housing and first and second electrodes engagable with a discharge lamp positioned in the socket; the housing having a bottom wall with a tubular enclosure extending upwardly from the bottom wall with the first electrode being positioned within the tubular enclosure; the insulating housing also including retention ribs on the exterior of the tubular enclosure, with the bottom wall being continuous beneath the ribs so that no opening for discharge through air is located adjacent to the tubular enclosure, the socket also including an elastic sleeve positioned on the tubular enclosure to form a seal between the tubular enclosure and a discharge lamp positioned in the socket.

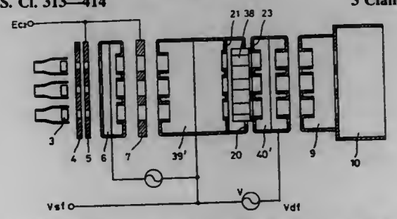
5,814,928
CATHODE RAY TUBE HAVING REDUCED DOMING EFFECT
Noriharu Matsudate, Kujukuri-machi; Ken Hashimoto, Mobara; Masahiro Nishizawa, Mobara; Masaharu Kumada, Mobara, and Satoshi Muto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 18, 1996, Ser. No. 715,463
Claims priority, application Japan, Sep. 18, 1995, 7-238713
Int. Cl.[6] H01J *29/80*
U.S. Cl. 313—402 **8 Claims**

1. A cathode ray tube comprising a panel portion with a phosphor layer formed on its inner face, an electron gun for projecting an electron beam toward said phosphor layer, a neck portion accommodating said electron gun, a funnel portion for coupling said panel portion to said neck portion, and a color selective electrode assembly having electron beam passing openings arranged opposite to said phosphor layer with a space therebetween, said color selective electrode assembly being installed within said panel portion, characterized in that



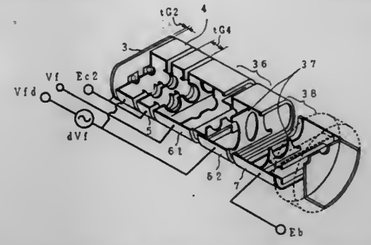
an electron beam reflection film of a bismuth oxide thin film having a bulk density of from 4 to 9.3 g/cm^3 is formed on a surface of said color selective electrode assembly facing said electron gun.

5,814,929
ELECTRON GUN WITH QUADRUPOLE ELECTRODE STRUCTURE
Sung Ho Jo, Kumi, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea
Continuation of Ser. No. 446,567, May 19, 1995, abandoned.
This application Apr. 24, 1997, Ser. No. 840,008
Claims priority, application Rep. of Korea, Sep. 14, 1994, 94-23251
Int. Cl.[6] H01J *29/46*
U.S. Cl. 313—414 **3 Claims**



1. An in-line electron gun for a color cathode-ray tube including a cathode, a control electrode, and an acceleration electrode, a preceding focus lens having at least two electrodes for focusing electron beams, and a main lens having a first acceleration/focusing electrode and a second acceleration/focusing electrode for accelerating and focusing said electron beams and projecting said beams on a fluorescent screen of said cathode-ray tube, comprising:
said first acceleration/focusing electrode divided into a static electrode applied with a static voltage and a dynamic electrode applied with a dynamic voltage, with said static and dynamic electrodes being separated from each other at constant intervals,
a side of said static electrode facing toward said dynamic electrode formed with a common opening for said electron beams, and a plain electrode having three apertures positioned inside said static electrode at constant intervals from said opening, and
said dynamic electrode having a pair of lens reinforcement partitions formed integral with round horizontal partitions which are positioned in a vicinity of said apertures and which have a curvature similar to that of said apertures, and linear partitions formed integral with said round horizontal partitions to provide a static facing side of said dynamic electrode with a quadrupole lens effect.

5,814,930
COLOR CATHODE RAY TUBE
Kenichi Watanabe, Obtaki; Syoji Shirai, Mobara; Shinichi Kato, Mobara, and Akiyoshi Tobe, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 27, 1997, Ser. No. 863,337
Claims priority, application Japan, Jun. 11, 1996, 8-149193
Int. Cl.[6] H01J *29/46*
U.S. Cl. 313—414 **12 Claims**



1. A color cathode ray tube having an in-line type electron gun comprising:
electron beam generating means including at least a cathode for producing three electron beams directed toward a phosphor screen, a first electrode and a second electrode, both constituting control electrodes and arranged in that order, and a heater for heating the cathode;
a third electrode, a fourth electrode and a fifth electrode, together constituting a sub-main lens for focusing the three electron beams onto the phosphor screen; and
a fifth electrode and a sixth electrode, both forming a main lens;
wherein electrical connections are made between the second electrode and the fourth electrode and between the third electrode and the fifth electrode;
wherein the first electrode has an aperture of 0.45 mm or smaller in diameter and the relation between a ratio A of the second electrode length in the tube axis direction to a second electrode aperture diameter and a ratio B of the fourth electrode length in the tube axis direction to a fourth electrode aperture diameter is in a region enclosed by four lines represented by
40A+88B−57=0
100A−260B−22=0
100A+176B−112=0
B−0.125=0.

5,814,931
COLD CATHODE AND CATHODE RAY TUBE USING THE COLD CATHODE
Hideo Makishima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 21, 1996, Ser. No. 734,695
Claims priority, application Japan, Oct. 23, 1995, 7-273800
Int. Cl.[6] H01J *1/46*
U.S. Cl. 313—441 **5 Claims**

1. A cold cathode comprising a substrate, a plurality of electron emission electrodes formed on said substrate, an insulating layer formed on said substrate except on said electron emission electrodes and their vicinity, a gate electrode formed on said insulating layer and having openings surrounding respective said electron emission electrodes, and a focusing electrode surrounding said gate electrode, said focusing electrode being divided into at least four

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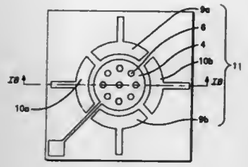
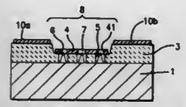




parts such that a pair of said focusing electrodes parts are facing each other with said gate electrode between them so as to be controlled at the same time.

5,814,932

PHOSPHOR, CATHODE-RAY TUBE, FLUORESCENT LAMP AND RADIATION INTENSIFYING SCREEN

Naotoshi Matsuda, Tokyo; Masaaki Tamatani, Fujisawa; Keiko Albessard, Yokohama; Miwa Okumura, Kawasaki; Takeshi Takahara, Yokohama, and Takeo Itou, Kumagaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 356,959, Dec. 16, 1994. This application Dec. 30, 1996, Ser. No. 774,421

Claims priority, application Japan, Dec. 17, 1993, 5-343241; Sep. 19, 1994, 6-223582; Sep. 19, 1994, 6-223583; Oct. 7, 1994, 6-270221

Int. Cl.[6] H01J *29/10*

U.S. Cl. 313—461 **2 Claims**

1. A radiation intensifying screen, comprising a screen base, a phosphor layer formed on said screen base, a protection film formed on said phosphor layer, wherein at least a part of the phosphor constituting said phosphor layer comprises transparent spherical particles having an average particle size of 0.5 to 20 μm and a ratio of the major diameter to the minor diameter of individual particles in the range of 1.0 to 1.5, and ultrafine particles having a diameter of 0.2 μm or less in an amount of 0.001–5 wt %.

5,814,933

CATHODE RAY TUBE HAVING AN IMPROVED FRONT PANEL

Tsuyoshi Iwata; Mutsumi Maehara, and Hiroshi Yoshioka, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1997, Ser. No. 810,731

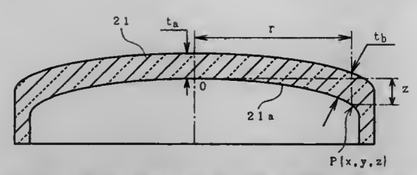
Claims priority, application Japan, Mar. 4, 1996, 8-046332

Int. Cl.[6] H01J *31/00*

U.S. Cl. 313—477 R **12 Claims**

1. A color cathode ray tube including an evacuated glass envelope comprising a panel portion, a funnel portion and a neck portion,

said panel portion including a front panel having a phosphor screen deposited on an interior surface thereof,



a contour of said interior surface being configured such that a radius Rx of a surface curvature of sections parallel to a horizontal axis and a radius Ry of a surface curvature of sections parallel to a vertical axis of said front panel are substantially constant, respectively, within a screen area of said phosphor screen.

5,814,934

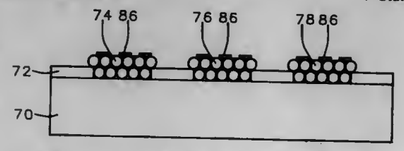
FIELD EMISSION DISPLAY WITH PATTERNED ANODE OVER PHOSPHOR

Chun-hui Tsai, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Division of Ser. No. 497,766, Jul. 3, 1995, Pat. No. 5,670,296. This application Apr. 28, 1997, Ser. No. 845,874

Int. Cl.[6] H01J *1/30;9/22*

U.S. Cl. 313—495 **7 Claims**



1. A field emission display having a baseplate and an opposing face plate, comprising:

a glass plate, acting as a base for said faceplate;

a patterned layer, having openings, of black matrix material formed over said glass plate;

a plurality of phosphorescent elements formed in and adjacent to said openings in said black matrix layer;

metal film formed over a portion of the top surface of each of said phosphorescent elements, whereby part of said phosphorescent elements are exposed;

said baseplate, formed on a substrate, which is mounted opposite and parallel to said faceplate;

a conductive layer over said substrate;

a plurality of electron-emitting tips formed on said baseplate, extending through openings in said reflective, conductive layer, and formed opposite to said phosphorescent elements; and

a means for establishing a differential voltage between said conductive layer and said metal film.

5,814,935

ORGANIC ELECTROLUMINESCENCE DEVICE

Takashi Ujihara, Yamagata-ken, Japan, assignor to Pioneer Electronic Corp., Tokyo, and Tohoku Pioneer Electronic Corp., Yamagata-ken, both of Japan

Filed Feb. 5, 1997, Ser. No. 795,774

Claims priority, application Japan, Feb. 7, 1996, 8-045492

Int. Cl.[6] H01J *1/62;63/04*

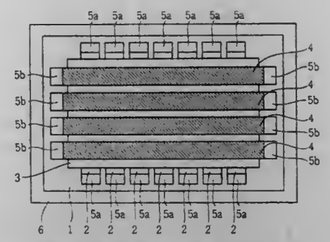
U.S. Cl. 313—504 **5 Claims**

1. An organic electroluminescence device comprising:

a first substrate;

at least one anode and at least one cathode formed on the first substrate as electrodes;

an organic luminous material layer formed between the anode and cathode;



a second substrate having at least two throughholes;

at least one first conductive pattern formed on one of sides of the second substrate;

at least two second conductive patterns formed on the other side of the second substrate;

one of the second conductive patterns being electrically connected to the first conductive pattern through one of the throughholes;

the first conductive pattern being electrically connected to one of the anode and cathode;

the other second conductive pattern being electrically connected to the other electrode of anode or cathode;

sealing means for joining the first and second substrates at the electrode side and the first pattern side and for hermetically sealing a space between the first and second substrates at peripheral portions thereof.

5,814,936

LOW-PRESSURE MERCURY DISCHARGE LAMP

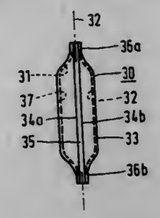
Karel L. Martinet, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1997, Ser. No. 857,547

Claims priority, application European Pat. Off., May 17, 1996, 96201392

Int. Cl.[6] H01J *61/20;61/24;7/10*

U.S. Cl. 313—545 **3 Claims**



1. A low-pressure mercury discharge lamp provided with a light-transmitting discharge vessel (**10**, **110**) which surrounds a discharge space containing mercury and a rare gas, and provided with means (**20**; **123***a*, **123***b*) for maintaining an electric discharge in said discharge space, a metal holder (**30**, **130**) supporting an amalgam (**31**, **131**) being arranged inside the discharge space, characterized in that the holder (**30**, **130**) is a metal plate (**33**, **133**) bent about an axis (**32**, **132**), and in that portions (**34***a*, **34***b*; **139***a*, **139***b*) of said plate bent towards one another define a slot (**35**, **135**), the holder being pinched together at its ends (**36***a*, **36***b*; **136**), while the amalgam (**31**, **131**) covers an internal surface (**37**, **137**) of the holder.

5,814,937

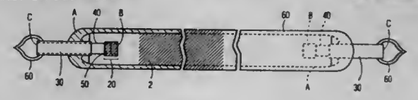
HOLLOW ELECTRODES FOR LOW PRESSURE DISCHARGE LAMPS, PARTICULARLY NARROW DIAMETER FLUORESCENT AND NEON LAMPS AND LAMPS CONTAINING THE SAME

Vivek Mehrotra, Rye Brook; Thomas F. McGee; Susan McGee, both of Peekskill, all of N.Y.; Jeroen Langevoort, Gulpen, and Edward Young, Maastricht, both of Netherlands, assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Dec. 29, 1995, Ser. No. 581,236

Int. Cl.[6] H01J *61/09;61/78*

U.S. Cl. 313—631 **60 Claims**



36. A low pressure discharge lamp, comprising

a tubular glass lamp envelope which is closed in a vacuum tight manner and which has end portions;

an ionizable filling gas in the lamp envelope;

at least one cylindrical electrode which enters the lamp envelope at an end portion;

at least one of said electrodes being a hollow cylindrical ferrule having a protrusion with a receptacle portion containing an emitter material, said ferrule being attached to said protrusion via a thermal isolator,

wherein the emitter material in said protrusion is a mixed oxide being a mixed oxide of Ba, Sr and mixtures thereof with one or more of the metals from the series comprising Ta, Ti, Zr, Sc, Y, and La.

5,814,938

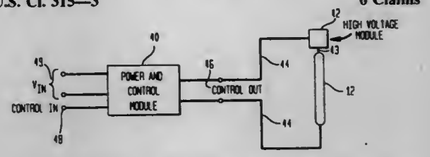
COLD CATHODE TUBE POWER SUPPLY

Robert Bèland, St. Marthe sur le Lac, and Pascal Kaufman, Ville de Deux Montagnes, both of Canada, assignors to Transfotec International, St. Eustache, Canada

Filed Aug. 5, 1996, Ser. No. 692,345

Int. Cl.[6] H01J *23/16*

U.S. Cl. 315—3 **6 Claims**



1. A power supply for providing high voltage power to a cold cathode tube comprising:

a control module including an input that receives an input voltage and an output that provides a high frequency low voltage power signal; and

a high voltage module coupled to the control module, including an input that receives the high frequency low voltage power signal from the control module and an output that provides the high voltage power to the cold cathode tube wherein the high voltage module is mounted internal to the cold cathode tube.

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5,814,939

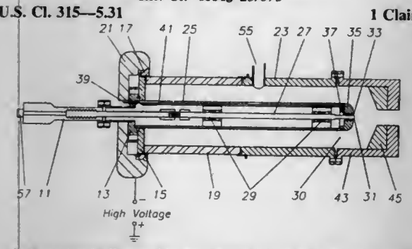
MECHANICALLY TUNABLE MAGNETRON INJECTION GUN (MIG)

Kwo R. Chu, 48-1 West Yuan, National Tsing Hua University, Hsinchu, Taiwan; Larry R. Barnett, 241 Normandy Rd., Normandy, Tenn. 37360; Chaoen Wang, 2F, 50 Lane 17, Tai Shun St., Taipei, Taiwan; Yih S. Yeh, 4F, 27 Lane 87, Sheh Jeng Rd., Taipei, Taiwan; Tze T. Yang, 14F, 35-1 Tian Mei St., Sec. 3, Hsinchu, Talwan; Han Y. Chen, 49 Jung Cheng St., Hua Lien, Taiwan; Shih H. Chen, P.O. Box 19-136, Hsinchu, Taiwan; Yi C. Tsai, 58-6 Lungkang, Tungshih, Chiai, Taiwan, and Trine Y. Dawn, 55 West Yuan, National Tsing Hua University, Hsinchu, Taiwan

Filed Feb. 12, 1996, Ser. No. 600,016

Int. Cl.[6] H01J *23/075*

U.S. Cl. 315—5.31 **1 Claim**



1. A mechanically tunable magnetron injection gun, comprising:

a ring-shaped electron emitter for producing a hollow annular electron beam;

said ring-shaped electron emitter embedded in a stainless steel outer electrode;

a center electrode surrounded by said ring-shaped electron emitter;

said outer electrode, said ring-shaped electron emitter and said center electrode providing a cathode assembly;

said cathode assembly being a part of said mechanically tunable magnetron injection gun;

said outer electrode, said ring-shaped electron emitter, said center electrode and said cathode assembly all aligned to a common center axis and providing a cathode assembly configured to be axially symmetric about said common center axis;

a magnetic field oriented parallel to said common center axis;

said ring-shaped electron emitter emitting a hollow annular electron beam, the center of said hollow annular electron beam aligned with said common center axis, said annular electron beam characterized by an electron beam quality and a transverse-to-axial velocity ratio;

a linear motion feedthrough connected with a high vacuum weld to a vacuum flange, said vacuum flange bolted onto a base plate to provide a high vacuum connection, a ring brazed to a ceramic insulator, said ring also connected with a high vacuum weld to said base plate, a corona ring fit around said ring, a vacuum container side wall brazed to said ceramic insulator, a vacuum pump for extracting air through a pumping port passing through a vacuum container side wall, a vacuum container bolted to said vacuum container side well to provide a high vacuum fit, an anode fitted into said vacuum container;

a stem welded to said vacuum flange, said stem extending within said ceramic insulator, said linear motion feedthrough extending within said stem and extending along said common center axis;

said linear motion feedthrough connected to a sliding shaft also aligned along said common center axis, said linear motion feedthrough held in position along said common center axis by linear ball bearings fit against inner walls of said stem;

said sliding shaft attached to said center electrode;

said linear motion feedthrough moving said sliding shaft along said common center axis in response to turning a knob attached to said linear motion feedthrough, wherein said sliding shaft is constrained to purely axial motion along said common center was by means of said linear ball bearings, wherein turning said knob results in purely axial motion of said center electrode along said common center axis and wherein sad purely axial motion of said center electrode along said common center axis is directly proportional to the rotation of said knob;

said center electrode moving purely axially along said common center axis within a hollow region inside of said hollow annular electron beam to tune said hollow annular electron bean from inside said hollow region thereby increasing said electron beam quality and sad transverse-to-axial velocity ratio of said hollow annular electron beam.

5,814,940

RADIO FREQUENCY PARTICLE ACCELERATOR HAVING MEANS FOR SYNCHRONIZING THE PARTICLE BEAM

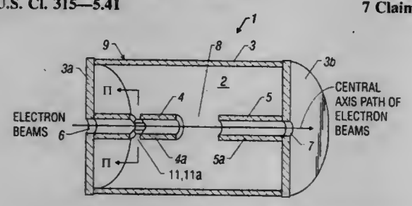
Takashi Fujisawa, Saitama-ken, Japan, assignor to Denki Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1996, Ser. No. 631,452

Claims priority, application Japan, Apr. 12, 1995, 7-085825

Int. Cl.[6] H05H *7/22*

U.S. Cl. 315—5.41 **7 Claims**



5. A radio-frequency particle accelerator for accelerating a charged particle beam along an axis with a radio-frequency electric field comprising a radio-frequency particle accelerating cavity and a cylindrical first inner conductor which surrounds the axis of the particle beam, said first inner conductor having an outer circumferential surface, said first inner conductor having an inductance, said first inner conductor situated inside said radio-frequency particle accelerating cavity, said first inner conductor having a beam entrance and exit and said accelerating cavity having a beam entrance end and a beam exit end and said accelerator including an outer conductor joined to said beam entrance end and said beam exit end, an accelerating gap at the beam exit of said first inner conductor, said outer conductor arranged to provide a resonant cavity with a capacitance across said accelerating gap, and

windows, each having a closed peripheral edge, are circumferentially disposed on the outer circumferential surface of said first inner conductor so as to provide a bunching gap inside said first inner conductor and so that said windows generate inductances coupled in parallel with said bunching gap, such that radio-frequency power supplied to said accelerator is divided by the inductances generated by said said windows and of said first inner conductor, so that a part of said radio-frequency power is supplied to said bunching gap so as to synchronize the particle beam to a radio-frequency accelerating phase.

5,814,941

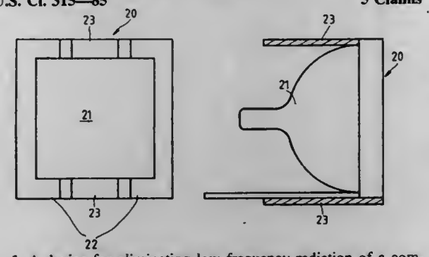
DEVICE FOR ELIMINATING LOW FREQUENCY RADIATION OF MONITOR

Teng-Feng Chen, Ping Chen, Taiwan, assignor to MAG Technology Co., Ltd., Taipel, Talwan

Filed Feb. 19, 1997, Ser. No. 802,066

Int. Cl.[6] H01J *29/06*

U.S. Cl. 315—85 **5 Claims**



1. A device for eliminating low frequency radiation of a computer monitor wherein the monitor includes a cathode ray tube with a screen having edge portions,

the device comprising a pair of first conductive plates disposed on two opposite first ones of the side edge portions of the screen of the cathode ray tube of the monitor to generate a radiation signal on the pair of first plates that is induced by the low frequency radiation of the monitor,

a circuit which amplifies and inverts the induced radiation signal to generate an inverted and amplified output signal,

a pair of second conductive plates arranged on another two opposite second ones of the side edge portions of the screen of the cathode ray tube and the second plates are connected with the circuit to cancel the low frequency radiation of the cathode ray tube.

5,814,942

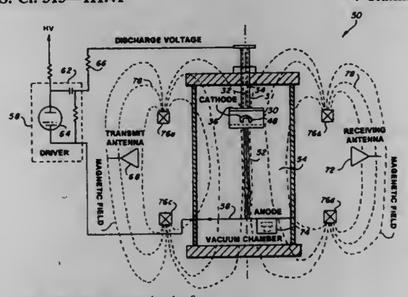
METHOD AND APPARATUS FOR GENERATING HIGH-DENSITY SHEET PLASMA MIRRORS USING A SLOTTED-TUBE CATHODE CONFIGURATION

Joseph Mathew, Silver Spring, Md., assignor to United States as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1997, Ser. No. 827,517

Int. Cl.[6] H05H *1/50*

U.S. Cl. 315—111.41 **4 Claims**



1. An apparatus comprised of:

means for generating a magnetic field;

means for generating a discharge voltage;

a cathode, within a vacuum chamber, of a predetermined length, circular in shape, having an inner cavity, and a slot of a predetermined width longitudinally along the cathode;

an anode, within said vacuum chamber, positioned a predetermined distance from the cathode; and

said means for generating a discharge voltage and means for generating a magnetic field cooperating to cause an equal discharge of electrons to be generated along the longitudinal length of said cathode inner cavity and discharged through the slot thereby producing a high-density plasma sheet between said cathode and said anode.

5,814,943

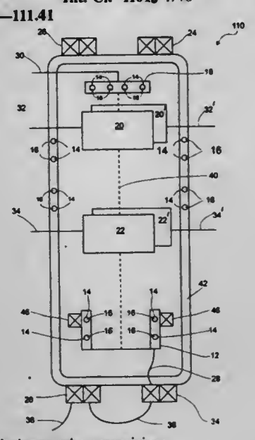
DIRECT CURRENT REGULATION PLASMA DEVICE

Victor Isaevich Adamovski, Petah Tikvah, Israel, assignor to New Devices Engineering A.K.O. Ltd., Petah Tikvah, Israel

Filed May 7, 1997, Ser. No. 852,485

Int. Cl.[6] H01J *1/46*

U.S. Cl. 315—111.41 **11 Claims**



1. A gas discharge tube comprising:

(a) a rigid envelope;

(b) a cathode, deployed within said envelope;

(c) an anode, deployed within said envelope, said cathode and said anode defining between them a current path;

(d) at least one pair of secondary electrodes, deployed within said envelope so that said current path runs between a first electrode of said at least one pair and a second electrode of said at least one pair, said first electrode of said at least one pair and said second electrode of said at least one pair defining between them a transverse direction; and

(e) a mechanism for creating a magnetic field substantially perpendicular to both said current path and said transverse direction, so that a plasma, within said envelope, wherethrough an electrical current travels from said anode to said cathode, is caused to separate into a positive region adjacent to said first electrode of said at least one pair and a negative region adjacent to said second electrode of said at least one pair.

5,814,944

HIGH PRESSURE SODIUM VAPOR LAMP WITH HIGH COLOR RENDERING

Naoki Saito; Atsunori Okada; Taku Sumitomo, and Koji Nishioka, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 16, 1997, Ser. No. 783,443

Claims priority, application Japan, Jan. 22, 1996, 8-008743; Apr. 22, 1996, 8-100531; Nov. 21, 1996, 8-310235

Int. Cl.[6] H01J *17/20*

U.S. Cl. 313—638 **15 Claims**

1. A high pressure sodium vapor lamp with high color rendering in which rare gas and metallic sodium are sealed in a mercury-free

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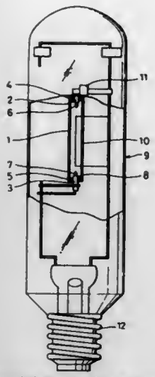


interior of a light-transmitting arc tube provided at both of its ends with electrodes, a pressure of said sealed rare gas is set at a value to cause a general color rendering index Ra to be 80 or more.

5,814,945

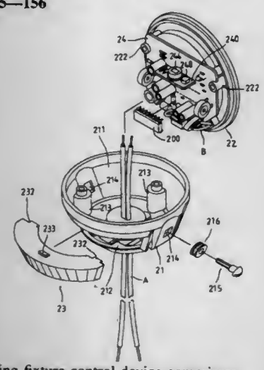
LIGHTING FIXTURE CONTROL DEVICE

Keen Hsu, F1.11, No. 195, Ning Hsia Rd., Taichung, Taiwan

Filed Oct. 16, 1997, Ser. No. 951,720

Int. Cl.[6] F21V *23/00*

U.S. Cl. 315—156 **7 Claims**



1. A lighting fixture control device comprises:

a base casing, an upper cover covering the base casing, an arc-shaped lens disposed on the base casing, an electric circuit board disposed on a bottom of the upper cover, and a control integrated circuit chip disposed on a bottom of the electric circuit board,

the electric circuit board having a photo-field-effect transistor,

the base casing having a hollow interior, an arc-shaped slot formed on a periphery of the base casing matching the arc-shaped lens, two through holes formed on the periphery of the base casing, and a plurality of hollow seats disposed in a bottom of the base casing,

two main wires passing through the bottom of the base casing and connected to the electric circuit board,

the upper cover having an aperture formed on a top rim of the upper cover and a plurality of hollow posts disposed on the bottom of the upper cover matching the hollow seats,

two branch wires passing through the aperture and connected to the electric circuit board,

the arc-shaped lens inserted in the arc-shaped slot,

each of the through holes receiving a cushion which receives an adjustment bolt.

5,814,946

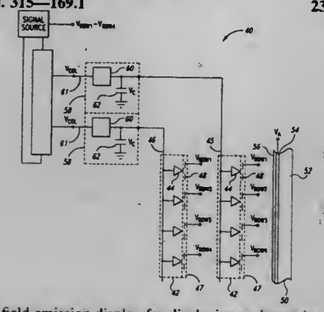
SEMICONDUCTOR JUNCTION BREAKDOWN TAP FOR A FIELD EMISSION DISPLAY

Garrett W. Hall, and David A. Zimlich, both of Boise, Id., assignors to Micron Display Technology, Inc., Boise, Id.

Filed Nov. 20, 1996, Ser. No. 752,831

Int. Cl.[6] G09G *3/12*

U.S. Cl. 315—169.1 **23 Claims**



11. A field emission display for displaying an image in response to an input signal, from a signal source wherein the input signal includes a portion exceeding a threshold voltage, comprising:

a transmission line coupled to the signal source and carrying a clearing pulse having a magnitude;

a transmission line tap having an input coupled to the transmission line and an output, the tap further including first and second opposed semiconductor junctions coupled between a transmission line and an output terminal, wherein the first junction is coupled to block current from flowing in a first direction and the second junction is coupled to block current from flowing in a second direction opposite the first direction, the second junction having a forward bias voltage, the first junction having a breakdown voltage substantially equal to the threshold voltage less the forward bias voltage of the second junction, the second junction having a breakdown voltage selected to correspond to the magnitude of the clearing pulse; and

a field emission display assembly coupled to the output terminal.

5,814,947

MULTI-SEGMENTED ELECTROLUMINESCENT LAMP WITH LAMP SEGMENTS THAT ARE TURNED ON AT OR NEAR AN AC ZERO CROSSING

Greg A. Brownell, South Bend, Ind., assignor to SEG Corporation, Mishawaka, Ind.

Division of Ser. No. 207,268, Mar. 7, 1994, Pat. No. 5,565,739, which is a continuation-in-part of Ser. No. 846,251, Feb. 26, 1992, Pat. No. 5,293,098. This application Mar. 30, 1995, Ser. No. 413,500

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—169.3 **5 Claims**

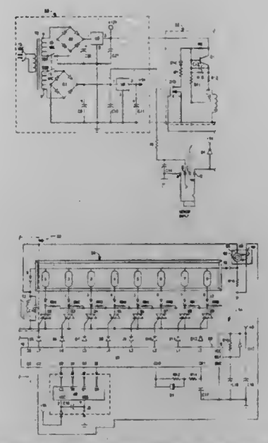
1. A circuit for powering a multi-segmented electroluminescent lamp, comprising:

a voltage supply for providing a direct current voltage;

a multi-segmented electroluminescent lamp having a plurality of individual lamp segments;

an inverter coupled to the voltage supply and the multi-segmented electroluminescent lamp for converting the direct current voltage of the voltage supply into a sinusoidal voltage to supply power to the multi-segmented electroluminescent lamp; and

a controller coupled to the inverter and the electroluminescent lamp for separately enabling the inverter and the lamp so that



the lamp segments are turned on at or near an AC zero crossing.

5,814,948

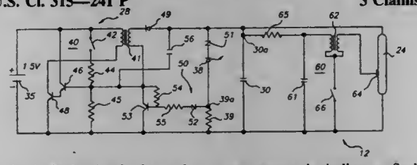
FLASH CIRCUIT FOR LOW COST CAMERAS

Paul Teremy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1997, Ser. No. 783,168

Int. Cl.[6] H05B *37/00*

U.S. Cl. 315—241 P **3 Claims**



1. A flash circuit for a low cost camera including a flash illumination element, a flash capacitor providing energy to illuminate said element, and an oscillating circuit for charging said capacitor; in which the flash circuit comprises:

a voltage sensing circuit including a voltage dependent resistor for sensing a voltage proportional to energy stored in said flash capacitor to produce a control effect on a component in the flash circuit when said voltage reaches a predetermined level.

5,814,949

AUTOMATIC PULSE GENERATOR CUTTOFF WITH CAPACITORS CONNECTED ON BOTH SIDES OF THE PRIMARY WINDING OF THE TRIGGER TRANSFORMER

Giuseppe Zanardo, and Luciano Zanardo, both of Verona, Italy, assignors to Photo Electronics Snc di Zanardo Giuseppe & C., Verona, Italy

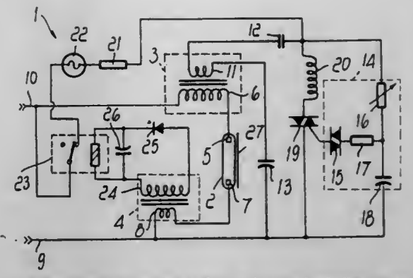
Continuation of Ser. No. 524,923, Sep. 8, 1995, abandoned. This application Sep. 19, 1997, Ser. No. 933,941

Claims priority, application Italy, Sep. 14, 1994, VR94 000055

Int. Cl.[6] H05B *41/14*

U.S. Cl. 315—289 **13 Claims**

1. A device for the lighting and istantaneous hot-relighting of lamps of the discharge type, comprising:



a first transformer having a first and second windings respectively supplied by first and second supply terminals, said second winding being connected to a first electrode of a discharge lamp and acting as a ballast for limiting the current of the lamp, said first and second windings of said first transformer being provided on a bobbin with a plurality of adjoining sections, said bobbin being inserted in a container filled with insulating material;

a first capacitor that is connected to one terminal of said first winding of the first transformer and a second capacitor that is connected between the other terminal of said first winding and said first supply terminal;

trigger means connected to said first winding of the first transformer and supplied by said first and second supply terminals;

discharge control means, connected to said trigger means and between one terminal of the first winding of the first transformer and the first supply terminal;

a second transformer having a first and second windings and series-connected to a second electrode of said discharge lamp, said second transformer acting as a current sensor;

switching means adapted to connect and interrupt the supply of power to said trigger means, said switching means being driven by said second transformer;

said discharge control means producing the discharge of said first and second capacitors on said first winding of the first transformer, said first winding inducing, on said second winding, a high voltage for the hot-lighting of said discharge lamp.

5,814,950

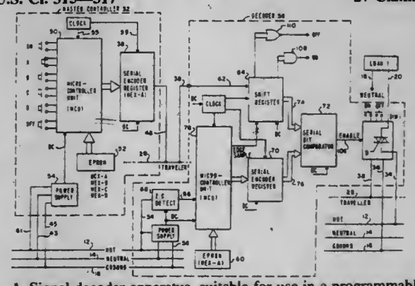
MULTIPLE CHANNEL, MULTIPLE SCENE DIMMING SYSTEM

Steven R. Carson, and Robert Anthony Floyd, both of Garland, Tex., assignors to The Genlyte Group Incorporated, Secaucus, N.J.

Continuation of Ser. No. 431,689, Apr. 28, 1995, Pat. No. 5,646,490. This application May 12, 1997, Ser. No. 854,550

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—317 **27 Claims**



1. Signal decoder apparatus, suitable for use in a programmable device, such as a lighting dimmer, that can be controlled from a location remote from the device independently of phase of AC supply power to which the device is connected in use, comprising:

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an input conductor for receiving control data signals and supplying the signals to input data register means coupled to the input conductor;

a memory for storing a number representing a predetermined operating condition for the programmable device;

power conductors for connection with an alternating current (AC) source of AC line voltage;

a zero cross detector coupled to one of the power conductors for producing a zero cross signal from zero cross transitions of AC line voltage;

a microcontroller, coupled to the memory, for containing an operating program to retrieve the stored number from the memory;

a stored data register, coupled to the microcontroller, for receiving a signal from the microcontroller representing the stored number;

the microcontroller also being coupled to the zero cross detector and the input data register means and including means responsive to zero cross signals from the zero cross detector to allow the input data register means to receive a control signal from the input conductor that is independent of phase of supply power and is in a form comparable to the stored number from the memory;

a comparator coupled to the input data register means and to the stored data register for receiving and comparing the control signal from the input data register means with the stored number signal from the stored data register and for producing an output enable signal in response to a match between the compared signals.

5,814,951

LOW-PRESSURE DISCHARGE LAMP CONTAINING A PARTITION THEREIN

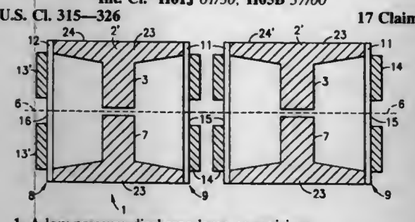
Ernst Smolka, Speyer; Klaus-Juergen Dietz, Wiesbaden; Franz Schilling, Maintal; Anke Schnabl, Hammersbach, and Beate Herter, Stuttgart, all of Germany, assignors to Heraeus Noblelight GmbH, Hanau, Germany

Filed Dec. 19, 1996, Ser. No. 769,550

Claims priority, application Germany, Dec. 20, 1995, 195 47 519.4

Int. Cl.[6] H01J *61/30;* **H05B** *37/00*

U.S. Cl. 315—326 **17 Claims**



1. A low-pressure discharge lamp comprising:

(a) a lamp envelope having a first sealed end portion and a second sealed end portion, said lamp envelope having a gas fill sealed therein, said gas fill forming a plasma in response to an application of a high-frequency electromagnetic field, said lamp envelope including:

a partition unit comprising:

(i) a side wall defining an interior space of said lamp envelope and (ii) a partition extending inwardly from said side wall and being formed integrally of an opaque, high temperature-resistant material as a single piece with said side wall, said partition disposed between said first sealed end portion and said second sealed end portion to divide said interior space of said lamp envelope into a first subspace and a second subspace, said partition having an aperture therethrough which communicates with said first subspace and said second subspace, said aperture having a cross-sectional size which is substantially smaller than a cross-sectional size of said lamp envelope at least at said first sealed end portion or said second sealed end portion, thereby constricting the plasma such that radiation generated by the plasma is emitted from said lamp envelope along an optical axis of said lamp envelope which coincides with an optical axis of said aperture,

at least one of said first sealed end portion and said second sealed end portion including a radiation emission window which is pervious to radiation generated by the plasma, and

(b) an electrode disposed at each of said first sealed end portion and said second sealed end portion, at least one of said electrodes being disposed on said radiation emission window, said at least one electrode having an opening which coincides with said optical axis of said lamp envelope and is in registration with said optical axis of said aperture.

5,814,952

DEVICE FOR CORRECTING THE RAMP LINEARITY OF SAW-TOOTH SIGNALS

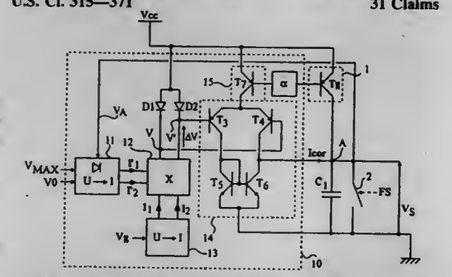
Philippe Maige, Seyssinet-Pariset; Nicolas Lebouleux, Grenoble, and Gilles Troussel, Saint Martin d'Heres, all of France, assignors to SGS-Thomson Microelectronics S.A., Agrate Brianza, Italy

Filed Aug. 23, 1996, Ser. No. 697,405

Claims priority, application France, Aug. 24, 1995, 95 10186

Int. Cl.[6] G09G *1/04;* **H01J** *29/70;* **H03K** *4/90*

U.S. Cl. 315—371 **31 Claims**



1. A device for correcting a ramp of a saw-tooth signal provided across a capacitor charged by a charging current provided by a first current source and periodically discharged at a desired frequency, the correcting device including means for modulating the charging current of the capacitor by a correction current to render the ramp of the saw-tooth signal non-linear, the correction current being proportional to the charging current provided by the first current source, and a transconductance amplifier receiving a differential voltage representative of a correction to be achieved and providing said correction current, said amplifier being biased by a second current source connected as a current mirror with the first current source.

5,814,953

POWER AMPLIFIER PREDRIVER STAGE

John Barrett George, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 18, 1995, Ser. No. 574,023

Int. Cl.[6] H01J *29/70;29/76*

U.S. Cl. 315—397 **14 Claims**

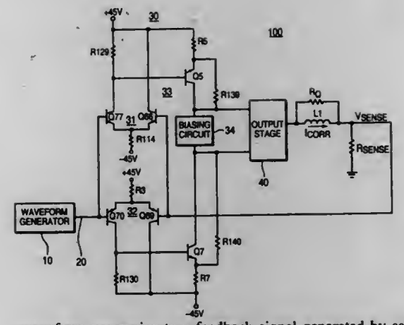
1. An amplifier circuit, comprising:

an output stage for driving a load;

first and second transistors in a push-pull configuration for driving said output stage;

first and second differential amplifiers for driving said first and second transistors, respectively, said first transistor being driven during positive-polarity excursions of an input voltage waveform responsive to a feedback signal generated by said load, and said second transistor being driven during negative-polarity excursions of said input voltage waveform responsive to said feedback signal; and,

means for limiting common-mode current flow between said first and second transistors.



5,814,954

METHOD OF AND AN APPARATUS FOR PROTECTING A REGENERATIVE RESISTOR IN AN INVERTER FOR DRIVING A SERVOMOTOR

Naoyuki Suzuki, and Shinichi Horikoshi, both of Oshino-mura, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

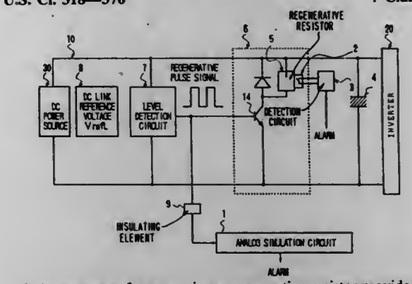
PCT No. PCT/JP96/01185, § 371 Date Dec. 23, 1996, § 102(e) Date Dec. 23, 1996, PCT Pub. No. WO96/34450, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 30, 1996, Ser. No. 765,855

Claims priority, application Japan, Apr. 28, 1995, 7-127507

Int. Cl.[6] H02P *3/14*

U.S. Cl. 318—376 **7 Claims**



1. An apparatus for protecting a regenerative resistor provided in a DC link connecting a DC power source and an inverter for controlling a servomotor, comprising:

level detecting means for detecting a voltage produced in said DC link by a regenerative power from said servomotor and for outputting a regenerative pulse signal when the detected voltage exceeds a first reference voltage;

switching means for applying a DC link voltage to said regenerative resistor in response to said regenerative pulse signal;

first protecting means for protecting said regenerative resistor by stopping power supply to said DC link when a temperature of said regenerative resistor increases to a predetermined value or greater; and

second protecting means having a charge-discharge circuit to be charged and discharged in response to said regeneration pulse signal outputted from said level detecting means and a comparator circuit for comparing the voltage of said charge-discharge circuit with a second reference voltage, for protecting said regenerative resistor by stopping power supply to said DC link when the voltage of said charge-discharge circuit exceeds said second reference voltage,

wherein a fusing region of said regenerative resistor is adjusted to be within at least one of a protective region of said first protecting means and a protective region of said second protecting means.

5,814,955

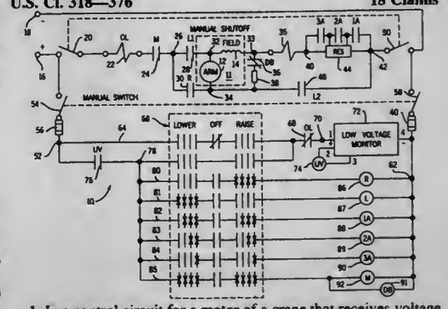
MOTOR CONTROL CIRCUIT WITH A LOW VOLTAGE MONITOR

Michael E. Bauer, Hartland, and Michael A. Urbassik, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 14, 1997, Ser. No. 818,186

Int. Cl.[6] H02P *3/14*

U.S. Cl. 318—376 **18 Claims**



1. In a control circuit for a motor of a crane that receives voltage from a power supply, the improvement comprising:

a switch through which electric current flows to control the motor in response to a control signal applied to a control terminal of the switch;

a monitor circuit which detects whether voltage supplied to the control circuit exceeds a threshold level and responds by producing a sensor signal, wherein the threshold level is greater than a voltage produced by the motor operating in a regenerative mode during failure of the power supply; and

a switch circuit that responds to the sensor signal by producing the control signal that is applied to the switch.

5,814,956

METHOD AND APPARATUS FOR CONTROL IN POWER FAILURE

Shinichi Kono, and Junichi Tezuka, both of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Continuation of Ser. No. 502,877, Jul. 17, 1995, abandoned. This application Jul. 22, 1997, Ser. No. 898,643

Claims priority, application Japan, Aug. 8, 1994, 6-185716

Int. Cl.[6] H02P *3/12;5/46*

U.S. Cl. 318—380 **10 Claims**

1. A method for controlling a machine tool and a workpiece to be machined by the machine tool, which are numerically controlled in synchronization during a power failure, comprising the steps of:

connecting an AC power line to a power regeneration circuit;

supplying power from said power regeneration circuit to a plurality of amplifiers to drive a tool drive motor, a workpiece drive motor and a tool feed motor;

regenerating rotation energy from said motors to DC power;

converting the regenerated DC power to AC power and returning the AC power to said AC power line;

detecting a power failure of said AC power line;

inhibiting the regenerated DC power from returning to said AC power line;

selectively connecting a discharge resistor unit to a DC link which interconnects the power regeneration circuit and the

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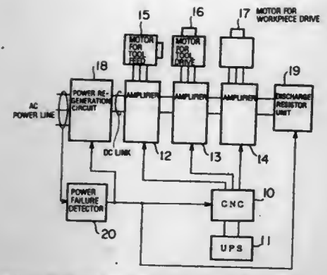


plurality of amplifiers in response to said detected power failure and when the regenerated DC sower exceeds a predetermined threshold;

decelerating the tool drive motor and the workpiece drive motor in synchronization; and

retracting the tool by driving the tool feed motor with the regenerative power produced in the deceleration of the tool drive motor and the workpiece drive motor via said DC link.

5,814,957

DIRECT CURRENT BRUSHLESS MOTOR AND DRIVING METHOD THEREFOR

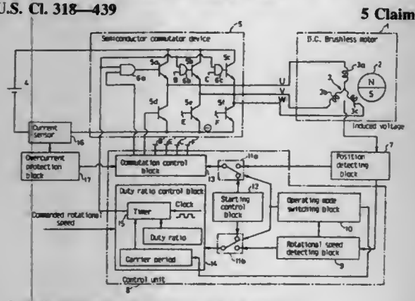
Makoto Yoshida, Kusatsu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Feb. 13, 1997, Ser. No. 800,154

Claims priority, application Japan, Feb. 14, 1996, 8-026396

Int. Cl.[6] H01R *39/46*

U.S. Cl. 318—439 **5 Claims**



1. A direct current brushless motor comprising:

a rotor having a permanent magnet,

a stator winding arranged in interlinkage with a magnet field generated by said permanent magnet, and

a control means for controlling a commutation of current flowing in said stator winding, a duty ratio of an applied voltage to said stator winding, and a carrier period for said duty ratio,

said control means switching over between a first operating mode at a starting operation and a second operating mode at an ordinary operation in accordance with at least one of a rotational speed of said rotor and time length from starting of said first starting mode, and

said control means adjusting said carrier period so that a first setting value to be adjusted in said first operating mode is larger than a second setting value to be adjusted in said second operating mode.

5,814,958

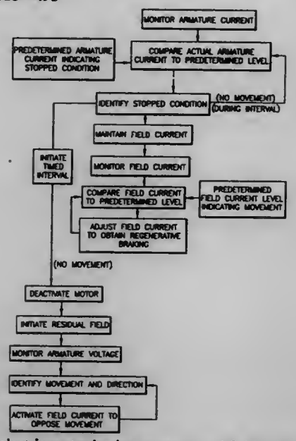
METHOD AND APPARATUS FOR THE ELECTRONIC CONTROL OF ELECTRIC MOTOR DRIVEN GOLF CAR

James C. Journey, Hephzibah, Ga., assignor to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 375,549, Jan. 19, 1995, Pat. No. 5,642,023. This application Dec. 31, 1996, Ser. No. 775,169

Int. Cl.[6] H02P *1/00*

U.S. Cl. 318—493 **3 Claims**



1. In an electric motor having armature and field coils which are independently excited by a source or voltage to generate armature and field currents, said motor having a characteristic performance profile, a method of controlling the motor to obtain a desired performance profile comprising:

(i) sensing the armature current of the motor and generating a signal relative thereto;

(ii) sensing the field current of the motor and generating a signal relative thereto;

(iii) predetermining armature current levels in the characteristic performance profile of the motor which are indicative of specific operational events;

(iv) predetermining field current levels which will enhance performance of the motor during the specific operational event to obtain the desired performance profile;

(v) comparing said armature current signal and said predetermined armature current levels and generating a field current adjustment signal for the specific operational event in accordance with said predetermined field current levels, when said armature current signal approaches a selected armature current level;

(vi) comparing the field current signal with the field current adjustment signal and adjusting the field current to obtain the predetermined field current and to obtain the desired performance profile.

5,814,959

GYRO-MOMENT COMPENSATION CONTROL METHOD AND APPARATUS

Youichi Nonaka, Fujisawa, and Shiyuki Sakaue, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

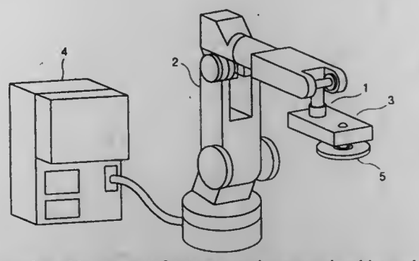
Continuation-in-part of Ser. No. 216,975, Mar. 24, 1994, Pat. No. 5,497,061. This application Jan. 17, 1996, Ser. No. 586,318

Claims priority, application Japan, Mar. 31, 1993, 5-073343

Int. Cl.[6] G05B *19/42;* **G06F** *15/46*

U.S. Cl. 318—568.11 **8 Claims**

1. A method of controlling a robot of a type including an end effector for contacting an object comprising the step of:



sensing with a sensor a force representing external and internal force of the end effector;

obtaining a force representing a gyro-moment generated from the end effector when the robot is moved;

subtracting the obtained force from the sensored force, and obtaining a resultant force; and

controlling the robot in accordance with the resultant force which represents a contact force of the end effector with the object.

5,814,960

ARM DRIVE DEVICE FOR INDUSTRIAL ROBOT

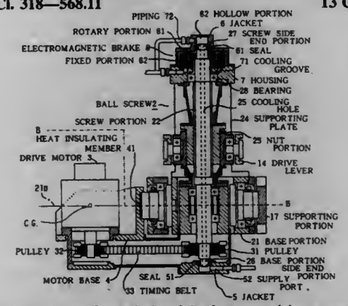
Masahiko Ookura; Tomoyuki Shiraki, and Katsunori Tsukamoto, all of Fukuoka, Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Fukuoka, Japan

Continuation of Ser. No. 374,546, May 30, 1995, abandoned. This application Sep. 30, 1997, Ser. No. 975,414

Claims priority, application Japan, Jun. 8, 1993, 5-164291

Int. Cl.[6] G05B *19/19*

U.S. Cl. 318—568.11 **13 Claims**



1. A drive device for an industrial robot comprising a stand, arm means rotatably supported on said stand, a ball screw means having a rotatable screw element and a base portion rotatably supporting said screw element, said ball screw means including a nut means rotatable on said screw element, connecting means connecting said nut means to said arm means for driving said arm means, said connecting means pivotably connecting said nut means to said arm means for pivotable movement about a first pivotal axis, said ball screw means including a drive motor mounted on said base portion for driving said screw element, a supporting portion on said stand pivotably supporting said base portion for pivotal movement of said base portion and said screw means about a second pivotal axis, said drive motor having an axis of rotation, said screw element having an axis of rotation which is perpendicular to said second pivotal axis, said drive motor being disposed in a position such that said axis of rotation of said drive motor is displaced from and parallel to said axis of rotation of said screw element, and power torque transmission means between said drive motor and said screw element such that said drive motor drives said screw element, said drive motor having a center of gravity which is substantially aligned with said axis of rotation of said screw element.

5,814,961

GUIDANCE SYSTEM FOR AUTOMATED GUIDED VEHICLE

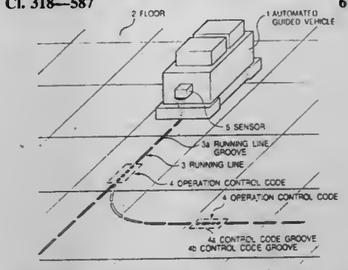
Eiichi Imahashi, Yamaguchi, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 3, 1997, Ser. No. 922,665

Claims priority, application Japan, Sep. 3, 1996, 8-233436

Int. Cl.[6] G05D *1/02*

U.S. Cl. 318—587 **6 Claims**



1. A guidance system for an automated guided vehicle which moves on a floor surface, comprising:

a running line composed of grooves of a predetermined length which are formed in said floor surface and which are arranged in a lengthwise direction to form a single array;

an operation control code composed of a combination of a plurality of grooves selected from groups having different lengths formed in said floor surface on said running line or in the proximity of said running line;

said automated guided vehicle comprising a sensor detecting said grooves for outputting a detection signal, a running line discriminating means receiving said detection signal for discriminating said running line to generate a running line discriminating signal, an operation control code discriminating means receiving said detection signal for discriminating said operation control code to generate an operation control code signal, and a drive control means receiving said running line discriminating signal and said operation control code signal for driving and controlling said automated guided vehicle.

5,814,962

SERVO CONTROLLER

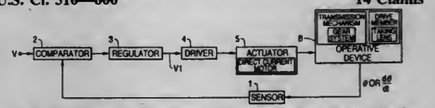
Kenji Mizumoto, Osaka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Jun. 6, 1996, Ser. No. 659,456

Claims priority, application Japan, Jun. 8, 1995, 7-141703

Int. Cl.[6] G05B *19/29*

U.S. Cl. 310—600 **14 Claims**



1. A servo controller for servo-controlling an operative device, the servo controller comprising:

an actuator which includes a motor and actuates the operative device;

a sensor which detects an operational state of the operative device;

a comparator which receives the detected operational state of the operative device from the sensor and compares the detected operational state with a target operational state to produce a control signal; and

a driver which is provided between the actuator and the comparator to drive the actuator in accordance with the control signal, the driver including a negative impedance circuit with respect to the actuator.

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5,814,963

DEVICE FOR DAMPING THE VIBRATIONS OF A STRUCTURE SUBJECTED TO DYNAMIC STRESSES

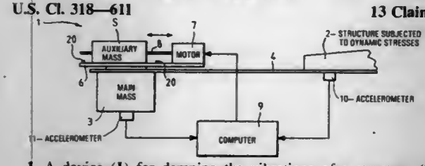
Laurent Jean Daniel Girard, Marseilles, and Thomas Pierre Louis Manfredotti, Eguilles, both of France, assignors to Eurocopter France, Marignane Cedex, France

Filed Oct. 9, 1996, Ser. No. 728,036

Claims priority, application France, Oct. 9, 1995, 95 11851

Int. Cl.[6] G05B *5/01*

U.S. Cl. 318—611 **13 Claims**



1. A device (1) for damping the vibrations of a structure (2) subjected to dynamic stresses, of the type including a main mass (3) mounted on an elastic plate (4) which is itself fitted into the structure (2) whose vibrations are to be damped, the position of said main mass (3) along said plate (4) being initially adjusted in such a way that the natural frequency (F) of the damping device (1) is equal to the frequency (Fe) of the vibrations of the structure (2) which are to be damped, wherein, in order to match the natural frequency (F) of the damping device (1) continuously to the frequency (Fe) of the vibrations of the structure (2) which are to be damped, the damping device (1) additionally comprises at least one auxiliary mass (5) guided axially without any radial play in a sleeve (13) connected to said main mass (3) by means of a support (6) and capable of being moved at least substantially parallel to said elastic plate (4) by a motor (7) mounted on said support (6) and receiving control pulses from a computer (9), said control pulses being computed from signals output by at least one of two accelerometers (10, 11) respectively measuring the vibrations of said structure (2) and those of said main mass (3).

5,814,964

STEPPING MOTOR DRIVING METHOD

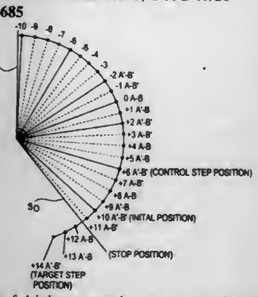
Makoto Kimura, Yokohama, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Jul. 8, 1996, Ser. No. 676,808

Claims priority, application Japan, Jul. 6, 1995, 7-170792

Int. Cl.[6] G05B *19/40;* **B60G** *11/26*

U.S. Cl. 318—685 **4 Claims**



1. A method of driving a stepping motor operable on a control signal having a predetermined number of excitation patterns switched in a predetermined sequence during each excitation cycle to rotate, at a predetermined angle defined by two stop positions, through step positions having sequential step numbers with respect to a reference step position, comprising the steps of:

with a control unit powered from a source of power for producing the control signal to the stepping motor, the control unit having a memory for storing a control step position upon interruption of the power to the control unit, the control unit resetting the stepping motor to an initial step position set near one of the stop positions when the power to the control unit is resumed, setting a target step position at a step number equal to the step number of the initial step position plus the number of excitation patterns included in each excitation cycle; and

driving the stepping motor to make steps in number equal to a difference of the step number of the control step position stored in the memory from the step number of the target step position.

5,814,965

REDUCED NOISE CONTROLLER FOR A SWITCHED RELUCTANCE MACHINE

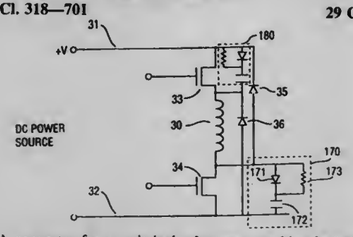
Steven Paul Randall, Leeds, United Kingdom, assignor to Switched Relutance Drives, Limited, Harrogate, United Kingdom

Filed Sep. 5, 1996, Ser. No. 706,554

Claims priority, application United Kingdom, Sep. 14, 1995, 9518837

Int. Cl.[6] H02P *1/46*

U.S. Cl. 318—701 **29 Claims**



1. A converter for a switched reluctance machine including at least one phase winding, the phase winding having a first terminal and a second terminal, the converter comprising:

a DC bus comprising a positive rail and a negative rail;

a first switching device coupled to the positive rail of the DC bus and to the first terminal of the phase winding, the first switching device switchable to couple and de-couple the first terminal of the phase winding to the positive rail of the DC bus;

a second switching device coupled to the negative rail of the DC bus and to the second terminal of the phase winding, the second switching device switchable to couple and de-couple the second terminal of the phase winding to the negative rail of the DC bus;

a first diode having an anode and a cathode, wherein the anode of the first diode is coupled to the negative rail of the DC bus and wherein the cathode of the first diode is coupled to the first terminal of the phase winding;

a second diode having an anode and a cathode, wherein the anode of the second diode is coupled to the second terminal of the phase winding and where the cathode of the first diode is coupled to the positive rail of the DC bus;

a first capacitor smoothing circuit comprising:

a third diode having an anode and a cathode, wherein the anode of the third diode is coupled to the positive rail of the DC bus;

a first resistor having a first terminal coupled to the anode of the third diode and a second terminal coupled to the cathode of the third diode; and

a first smoothing capacitor having a first terminal coupled to the cathode of the third diode and a second terminal coupled to the first terminal of the phase winding, wherein the first smoothing capacitor is sized to control the transition of the voltage across the phase winding from a first voltage level to a second voltage level when both the first and the second switching devices are switched off; and

a second capacitor smoothing circuit comprising:

a fourth diode having an anode and a cathode, wherein the anode of the fourth diode is coupled to the second terminal of the phase winding;

a second resistor having a first terminal coupled to the anode of the fourth diode and a second terminal coupled to the cathode of the fourth diode; and

a second smoothing capacitor having a first terminal coupled to the cathode of the fourth diode and a second terminal coupled to the negative rail of the DC bus, wherein the second smoothing capacitor is sized to control the transition of the voltage across the phase winding from the second voltage level to a third voltage level when both the first and the second switching devices are switched off.

5,814,966

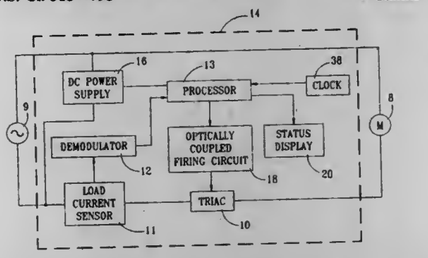
DIGITAL POWER OPTIMIZATION SYSTEM FOR AC INDUCTION MOTORS

David L. Williamson, and Ryan Corley, both of Austin, Tex., assignors to National Power Systems, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 287,129, Aug. 8, 1994, abandoned. This application Feb. 12, 1996, Ser. No. 598,614

Int. Cl.[6] H02P *5/98*

U.S. Cl. 318—798 **6 Claims**



1. Apparatus for controlling the operation of an AC induction motor, comprising:

switching means for switching AC voltage to the induction motor between a turn on state and a turn off state;

means for sensing the amplitude of inrush current to the induction motor following a voltage zero crossing of the AC voltage applied to the induction motor;

a controller including means for sensing the amplitude of the inrush current as a function of time delay between a voltage zero crossing and the turn on of said switching means, and further including means for sensing a decrease in the amplitude of the inrush current following a peak in the inrush current amplitude, said controller including means for measuring the time interval between the turn on of said switching means and the time of sensing of said decrease in the amplitude of the inrush current to generate a control signal; and

means responsive to the control signal for controlling the turn on of said switching means for each successive half cycle of the AC voltage applied to the induction motor following a voltage zero crossing.

5,814,967

APPARATUS TO REDUCE NO LOAD CURRENT AT LOW FREQUENCIES

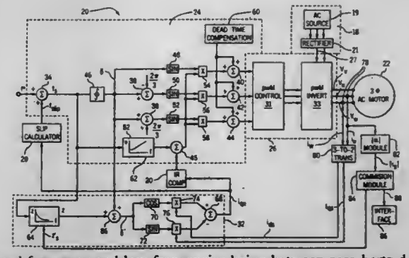
Luis J. Garces, Mequon, and David M. Brod, Greendale, both of Wis., assignors to Allen Bradley Company, LLC, Milwaukee, Wis.

Filed Aug. 13, 1997, Ser. No. 910,264

Int. Cl.[6] H02P *7/628*

U.S. Cl. 318—807 **19 Claims**

1. An apparatus to be used with a motor controller which adjusts motor operation at low frequencies and under no load conditions by altering PWM command signals as a function of a torque current i_{qr}, wherein current i_{qr} is a real component of an apparent current and forms a phase angle therewith, the motor having a



rated frequency and low frequencies being between zero hertz d a maximum percent of the rated frequency where the maximum percent is 50% or less, the controller including a sensor which is incapable of precisely determining the phase angle at the low frequencies, the apparatus for compensating for phase angle errors, the controller providing an applied stator voltage frequency signal, the apparatus comprising:

an integrator receiving the applied frequency signal and integrating the signal to provide a perceived phase angle;

an error module receiving the applied frequency signal and generating a corresponding correction angle;

a current detector providing stationary torque and stationary current feedback signals i_{qs}, i_{ds}, respectively; and

a calculator for mathematically combining the perceived angle, the correction angle and the stationary current signals i_{qs}, i_{ds} to provide a corrected torque current i_{qc}.

5,814,968

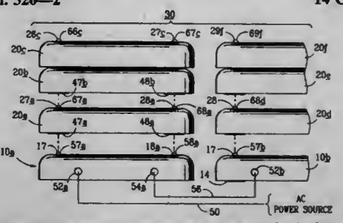
BATTERY CHARGER AND RECHARGEABLE ELECTRONIC PAGING DEVICE ASSEMBLY

Kenneth J. Lovegreen, Lewisville; Russell P. Blink, Richardson, and James A. Henderson, Duncanville, all of Tex., assignors to Long Range Systems, Inc., Dallas, Tex.

Filed Jun. 26, 1995, Ser. No. 494,921

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—2 **14 Claims**



1. A battery charger and rechargeable electronic device assembly, comprising:

a battery charger base unit having a voltage input port, a voltage output port and an upper supporting surface with a plurality of electrical charging terminals extending perpendicularly above said supporting surface;

a plurality of stackable rechargeable electronic devices, each said device having a perimeter, opposing top and bottom surfaces, and an internal rechargeable power source;

a plurality of electrical terminals in electrical communication with said internal rechargeable power source and disposed transversely through said top and bottom surfaces, each electrical terminal having a first end extending through the top surface of the electronic device and a second end extending through the bottom surface of the electronic device; wherein said first end of the terminal slidably connects with the second end of any one terminal on an adjacently stacked electronic device to establish an electrical connection between the base unit and the adjacently stacked electronic device for simultaneously recharging the internal power source of each elec-

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tronic device without regard to the respective orientation of the perimeters of each device.

5,814,969

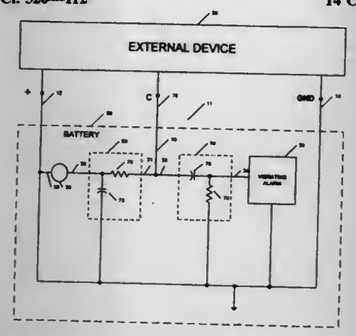
APPARATUS FOR SELECTIVELY ACTIVATING A PLURALITY OF DEVICES

Timothy James Banyas, Cary, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Sep. 23, 1996, Ser. No. 717,970

Int. Cl.[6] H02J *7/00*

U.S. Cl. 320—112 **14 Claims**



1. An apparatus for selectively activating a plurality of functional devices within a battery housing, comprising:

at least one connection intermediate the battery housing and at least one external device; and

a plurality of signal distinguishing devices disposed within said battery housing and coupled with said at least one connection;

wherein each of said plurality of functional devices performs at least one function and each of the functional devices is coupled with said plurality of signal distinguishing devices in a configuration facilitating said selective operation.

5,814,970

APPARATUS FOR CHARGE EXCHANGE AMONG A PLURALITY OF SERIES CONNECTED ENERGY ACCUMULATORS OR ENERGY CONVERTERS

Heribert Schmidt, Emmendingen, Germany, assignor to Fraunhofer-Gesellschaft Zur Forderung der Angewandten Forschung e.V., Munchen, Germany

PCT No. PCT/DE95/00791, § 371 Date Jan. 29, 1997, § 102(e) Date Jan. 29, 1997, PCT Pub. No. WO96/04564, PCT Pub. Date Feb. 15, 1996

PCT Filed Jun. 13, 1995, Ser. No. 793,088

Claims priority, application Germany, Jul. 30, 1994, P4427077.1

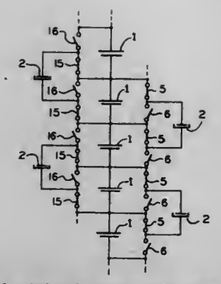
Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—118 **3 Claims**

1. An apparatus for effecting an exchange of electric charge between a plurality of like, series connected, energy accumulators which define an overall energy accumulator, said apparatus comprising:

a plurality of series connected energy accumulators;

a plurality of electric storage elements, each said storage element comprising an element which is capacitively charged from said energy accumulators;



a plurality of switches for respectively connecting one of said energy accumulators in parallel with one of said electric storage elements;

a clock for defining alternate time periods for alternately opening and closing said plurality of switches, whereby two adjacent said energy accumulators are alternately connected in parallel with one of said electric storage elements in said time periods.

5,814,971

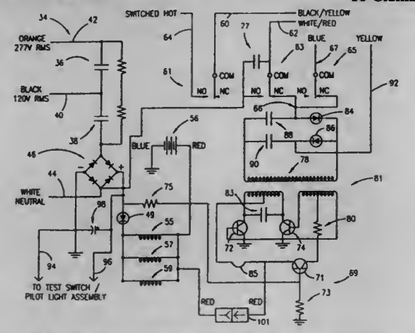
EMERGENCY FLORESCENT INVERTER FOR MAGNETIC AND ELECTRONIC BALLASTS

James C. Johnson, Conyers, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Dec. 29, 1997, Ser. No. 998,582

Int. Cl.[6] H02J *9/06;* **H05B** *41/29*

U.S. Cl. 320—127 **16 Claims**



1. In an emergency lighting system which can be connected to a fluorescent lighting fixture having at least one discharge lamp and a ballast for driving the lamp, the ballast being a magnetic ballast or an electronic ballast having an output stage which is magnetically isolated from remaining ballast circuitry, the ballast having a primary side for connection to normal AC power and a lamp side connected to the lamp, improved inverter circuitry having first and second power leads and a first lamp connection lead, the first and second power leads being connected to the primary side of the ballast and the first lamp connection lead being connected to a first lamp side, the inverter circuitry producing a DC output through the lamp connection lead to the lamp, the inverter circuitry being improved by means additional to the first lamp connection lead for coupling or connecting the output of the inverter circuitry to the lamp, said means being employed in the system when said electronic ballast is used therein, only the first lamp connection being necessary in the system when said magnetic ballast is used therein.

5,814,972

ELECTRONIC APPARATUS HAVING MULTIPLE LOADS, DRIVEN BY PLURAL BATTERIES

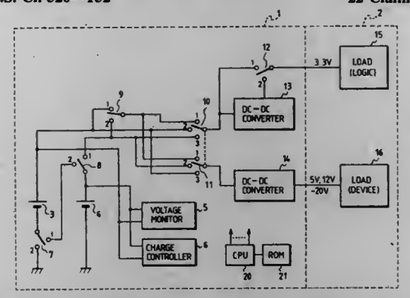
Kazutoshi Shimada, Yokosuka; Eisaku Tatsumi, Yokohama; Shinichi Sunakawa, Kawasaki, and Katsuhiko Nagasaki, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 239,543, May 9, 1994, abandoned. This application Apr. 24, 1997, Ser. No. 845,365

Claims priority, application Japan, May 13, 1993, 5-135441

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—132 **22 Claims**



18. A method of operating a power supply control apparatus which has a battery, comprising the steps of:

detecting an output voltage of the battery;

generating a voltage in response to the output voltage of the battery, using a generating means;

connecting the battery to a load; and

controlling said connecting step, to connect the battery to the load via the generating means when said detecting step detects that the output voltage of the battery is higher than a first value or lower than a second value and to connect the battery directly to the load when said detecting step detects that the output voltage of the battery is lower than or equal the first value or higher than or equal to the second value.

5,814,973

POWER UNIT AND CHARGER FOR A BATTERY POWERED ELECTRICAL APPARATUS AND METHOD

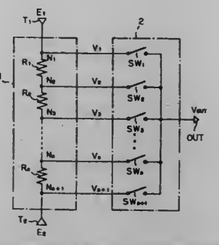
Jiewen Liu, Cary, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Sep. 20, 1996, Ser. No. 717,098

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—137 **12 Claims**

Fig. 1 PRIOR ART



1. A method of operating a battery powered electrical apparatus with a current source, wherein the current source is one of a constant current source and a time varying current source, the method comprising:

(a) measuring an input current (I_{input}) from the current source;

(b) selecting a desired output current ($I_{out\text{-}des}$) in accordance with predetermined operating parameters;

(c) determining a duty cycle in accordance with I_{input} and $I_{out\text{-}des}$; and

(d) supplying power (I_{output}) to the electrical apparatus in accordance with the duty cycle.

5,814,974

Patent Not Issued For This Number

5,814,975

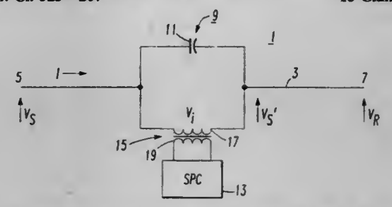
INVERTER CONTROLLED SERIES COMPENSATOR

Robert J. Nelson, Orlando, and Donald G. Ramey, Maitland, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 5, 1995, Ser. No. 471,805

Int. Cl.[6] G05F *1/70*

U.S. Cl. 323—207 **13 Claims**



1. Apparatus for providing series compensation in an ac electrical power transmission system having a transmission line carrying an ac current at a selected transmission line voltage and fundamental frequency, said apparatus comprising:

a reactive impedance element connected in series in said ac transmission line;

switching power converter means generating an alternating voltage at said fundamental frequency with controllable magnitude and controllable phase angle;

means connecting said switching power converter means in parallel with said reactive impedance element to impress said alternating voltage across said reactive impedance element and thereby control flow of said current through said transmission line; and

control means controlling said controllable magnitude and said controllable phase angle of said alternating voltage to control said current.

5,814,976

HIGH POWER FACTOR ELECTRONIC BALLAST

Joseph M. Allison, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 543,457, Oct. 16, 1995, abandoned. This application Aug. 6, 1997, Ser. No. 907,248

Int. Cl.[6] G05F *1/613*

U.S. Cl. 323—224 **8 Claims**

1. A high power factor electronic ballast for operating a high pressure gas discharge lamp comprising:

a boost converter function; and

a buck function;

wherein the boost converter function and the buck function have common components;

wherein the common components comprise a single power switching transistor;

wherein the single power switching transistor chops power to flow at high frequency from a mains bridge rectifier, into a dc

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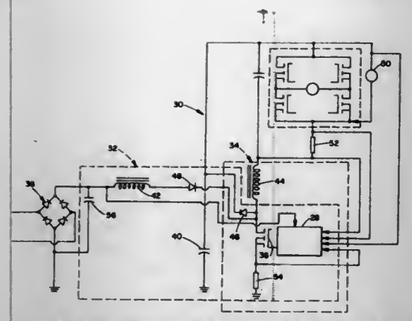


energy storage capacitor, and through a boost inductor in boost converter fashion; and

wherein the high power factor electronic ballast accepts ac power as an input and produces dc power as an output.

5,814,977

POWER SUPPLY FOR COMPENSATING A FAILED VOLTAGE

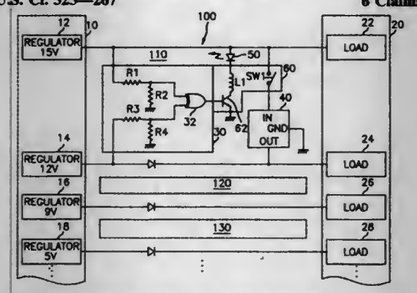
Ji-Hyeon Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 8, 1995, Ser. No. 555,355

Claims priority, application Rep. of Korea, Dec. 29, 1994, 94-38626

Int. Cl.[6] G05F *1/577;* **H02J** *1/10*

U.S. Cl. 323—267 **6 Claims**



1. A power supply capable of compensating a failed voltage occurred therein, which comprises:

a plurality of voltage sources arranged in a descending order by their voltage capacity; and

an arrangement having a plurality of voltage compensation blocks, each of the voltage compensation blocks being intercalated between a pair of voltage sources in such a way that each voltage compensation block connects a first voltage source in the pair to a second voltage source in the pair, the first voltage source generating a first voltage needed to activate its corresponding first load and the second voltage source generating a second voltage needed to activate its corresponding second load and a level of the first voltage being higher than that of the second voltage, wherein said each of the voltage compensation blocks includes:

means for detecting a failure in either the first or the second voltage source to produce a failure detection signal;

means, connected between an output of the first voltage source and the second load, for converting the first voltage to an equivalent to the second voltage needed to activate the second load; and

means, connected between the output of the first voltage source and the converting means and in response to the failure detection signal, for applying the first voltage to the converting means.

5,814,978

POWER SUPPLY CIRCUIT FOR A PRINTER

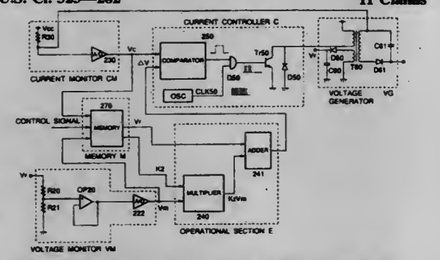
Koji Ida, Tokyo, Japan, assignor to Oki Data Corporation, Tokyo, Japan

Filed Mar. 21, 1997, Ser. No. 821,943

Claims priority, application Japan, Mar. 21, 1996, 8-091918

Int. Cl.[6] G05F *1/40;* **G03G** *15/16*

U.S. Cl. 323—282 **11 Claims**



1. A power supply circuit for use in a printer, comprising:

a voltage generator, generating an output voltage to supply an output current to an external circuit;

a voltage monitor, monitoring the output voltage to produce a voltage-monitoring signal;

an operational section, determining a correction value for the output current on the basis of a reference current of the output current and the voltage-monitoring signal; and

a current controller, controlling said voltage generator in accordance with the correction value in such a way that the output current becomes progressively smaller than the reference current as the correction value increases.

5,814,979

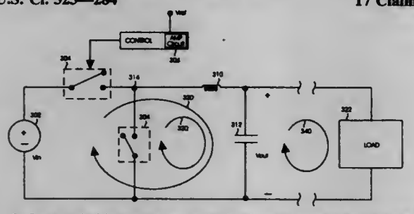
LOW DROP OUT SWITCHING REGULATOR

Michael Arthur Grimm, Boulder Creek, Calif., assignor to Maxim Integrated Products, Inc., Sunnyvale, Calif.

Filed Jun. 1, 1995, Ser. No. 456,739

Int. Cl.[6] G05F *1/618*

U.S. Cl. 323—284 **17 Claims**



1. In a switching power supply having a switch, an oscillator signal having a plurality of periodic on times and a plurality of periodic off times, a first signal having an asserted state and a deasserted state for controlling said switch, an inductor coupled to said switch, and a capacitor coupled to said inductor, a method for generating an output voltage from an input voltage supplied by an input source, comprising:

closing said switch substantially at a start of a first on time of said plurality of periodic on times of said oscillator signal and while said first signal is deasserted. said first signal being deasserted when said output voltage is below a predefined value, to permit current from said input source to flow through said inductor and said capacitor of said switching power supply. thereby building up an inductor current through said inductor and increasing said output voltage across said capacitor;

opening said switch substantially upon an assertion of said first signal, said first signal being in said asserted state when said output voltage is above said predefined value; and

keeping said switch closed past a first off time of said oscillator signal, said first off time being an off time immediately subsequent to said first on time to continue building up said inductor current through said inductor and increasing said output voltage across said capacitor if said first signal is not asserted at a start of said first off-time of said oscillator signal.

5,814,980

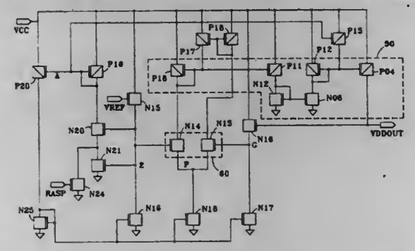
WIDE RANGE VOLTAGE REGULATOR

Scott C. Lewis, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 3, 1996, Ser. No. 706,861

Int. Cl.[6] G05F *3/04*

U.S. Cl. 323—311 **19 Claims**



1. A voltage regulator system having a reference input and a system output comprising:

a differential amplifier having a first input, a second input, and an amplifier output, the first input coupled to the reference input and the second input coupled to the system output, and wherein the amplifier output provides an output current proportional to the voltage difference between the reference input voltage and the system output voltage; and

a linear multiplier having an input and an output, the linear multiplier input coupled to the amplifier output and the linear multiplier output coupled to the system output, said linear multiplier output providing a system output current to said system output, said system output current driving said system output to bave a voltage substantially equal to said reference input.

5,814,981

VOLTAGE CIRCUIT FOR GENERATING MULTIPLE STABLE VOLTAGES

Hiroshi Tsuchi, and Hiroshi Hayama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 18, 1997, Ser. No. 802,548

Claims priority, application Japan, Feb. 15, 1996, 8-027623

Int. Cl.[6] H03H *7/00*

U.S. Cl. 323—369 **23 Claims**

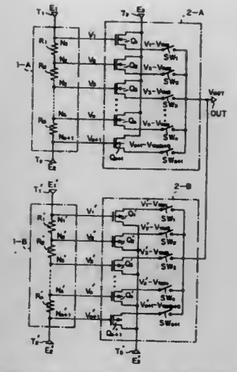
1. A multi-valued voltage generating circuit comprising:

a voltage divider connected between first and second nodes and formed by a series of resistors;

an output circuit, connected to said first and second nodes and nodes of said resistors, for selecting one of voltages at said first and second nodes and said nodes of said resistors and generating said one selected voltage at an output terminal;

first and second control voltage circuits, each connected to one of said first and second nodes, for controlling voltages at said first and second nodes to compensate for fluctuations of said selected voltage at said output terminal by a fluctuation of said output circuit; and

first and second current control circuits, each connected to one of said first and second nodes, for controlling currents flowing



through said series of resistors to control a difference in potential between said first and second nodes at a certain value.

5,814,982

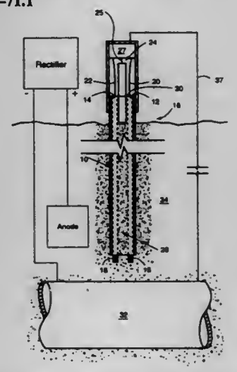
COUPON TEST STATION FOR MONITORING THE EFFECTIVENESS OF CATHODIC PROTECTION

Neil G. Thompson, Dublin, and Kurt M. Lawson, Sugar Grove, both of Ohio, assignors to CC Technologies Systems, Inc., Dublin, Ohio

Filed Jul. 2, 1997, Ser. No. 887,498

Int. Cl.[6] G01N *27/42*

U.S. Cl. 324—71.1 **13 Claims**



1. A test station for measuring the effectiveness of cathodic protection provided by a cathodic protection system for mitigating the corrosion of a metal structure immersed in an electrolyte, the test station comprising:

(a) a nonconductive reference tube having first and second opposite reference tube ends, and a sidewall surrounding and defining an interior, elongated chamber;

(b) first and second spaced coupon tubes mounted to the sidewall of the reference tube within the chamber, each coupon tube having a sidewall terminating in a coupon tube end near the first reference tube end;

(c) a first coupon of substantially the same metal as the immersed structure, said coupon being mounted to said end of the first coupon tube and having an attached electrically

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insulated conductor extending from the coupon through the first coupon tube for connecting to the immersed structure; and

(d) a second coupon of substantially the same metal as the immersed structure, said coupon being mounted to said end of the second coupon tube and having an attached electrically insulated conductor extending from the coupon through the second coupon tube.

5,814,983

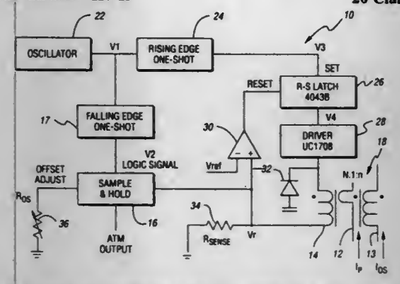
METHOD FOR SENSING DC CURRENT AND SENSOR FOR CARRYING OUT SAME

Kin E. Shum, Los Angeles, Calif., assignor to Hughes Electronics Corporation, Los Angeles, Calif.

Filed Jun. 7, 1996, Ser. No. 664,929

Int. Cl.[6] G01R *33/00*

U.S. Cl. 324—117 R **20 Claims**



8. A sensor for measuring a first DC current in a first circuit, the first DC current flowing in a predetermined direction, the sensor comprising:

a second circuit electromagnetically coupled to the first circuit for generating a second DC current wherein the second circuit has current flowing in the same direction as the first DC current, the second DC current improving the accuracy of the measurement of the first DC current at low levels of the first DC current;

a third circuit electromagnetically coupled to the first circuit for generating a third DC current representative of the first DC current; and

a measuring device for measuring the first DC current based on the third DC current having a resistor for converting the third DC current into a voltage signal,

wherein the first, second and third circuits comprise a current transformer having primary, offset and secondary windings, respectively, each having a predetermined number of turns, and

wherein the measuring device measures the first DC current in accordance with the following:

$$I_p=(V_r*N)/R_{sense}-n*I_{os},$$

where I_p is the first DC current, V_r is the voltage signal, N corresponds to the number of turns in the secondary winding, R_{sense} corresponds to a value of the resistor, n corresponds to the number of turns in the offset winding and I_{os} corresponds to the second DC current.

5,814,984

ROLLER BEARING UNIT HAVING AN IMPROVED STRUCTURE FOR RETAINING AND SEALING A COVER THEREON

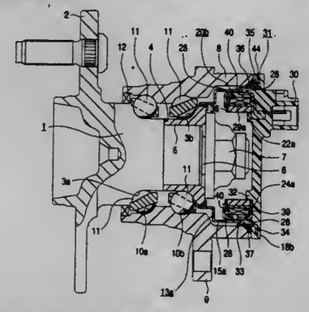
Hayato Ohmi, and Hideo Ouchi, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Aug. 22, 1996, Ser. No. 697,347

Claims priority, application Japan, Aug. 22, 1995, 7-213478; Dec. 20, 1995, 7-332133; Jun. 7, 1996, 8-146047; Jul. 5, 1996, 8-176553

Int. Cl.[6] G01P *3/44;3/488*

U.S. Cl. 324—173 **4 Claims**



1. A rolling bearing unit having a rotating speed detector, comprising:

an outer race being fixed and including an outer raceway on an inner circumferential surface of the outer race;

an inner race being rotatable and including an inner raceway on an outer circumferential surface of the inner race;

a plurality of rolling elements arranged to be freely rolled between the outer raceway and the inner raceway;

a cover made of synthetic resin and fixed to an opening end of the outer race;

a detector including a detected element fixed to the inner race and a sensor embedded in the cover for detecting a rotating speed in cooperation with the detected elements;

a sleeve made cylindrically of metal and fixed onto the cover, wherein a first leaking passage exists between a first clearance defined between engaging surfaces of the sleeve and the outer race and a third clearance defined between engaging surfaces of the outer race and the cover, the first and the third clearances being arranged in series to each other, and a second leaking passage exists between the third clearance and a second clearance formed in a contact portion of the sleeve with the cover, the third and the second clearances being arranged in series to each other; and

a seal ring fitted between the cover and the outer race at a position located in series to the first and the second leaking passages.

5,814,985

INCREMENTAL SENSOR OF SPEED AND/OR POSITION FOR DETECTING LOW AND NULL SPEEDS

Claude Oudet, Besancon, France, assignor to Moving Magnet Technologies S.A., Besancon, France

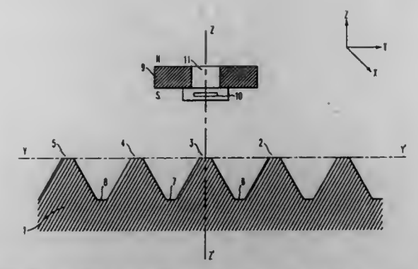
Filed Sep. 15, 1995, Ser. No. 530,723

Claims priority, application France, Sep. 16, 1994, 94 11078; Jun. 19, 1995, 95 07306

Int. Cl.[6] G01B *7/14;7/30;* **G01R** *33/06;* **H01L** *43/06*

U.S. Cl. 324—207.2 **36 Claims**

1. Incremental sensor of position and/or speed of the type which includes a moving component made of a soft material that has at least one moving tooth in a direction OZ opposite a permanent magnet magnetized along the direction OZ approximately perpendicular to the OY axis and a probe which is sensitive to the direction and strength of a magnetic field, such as a Hall-effect



gaussmeter, arranged in the air gap between the magnet and the tooth of the moving component so that its axis with greatest sensitivity is approximately oriented along the OZ axis, characterized in that the Hall-effect gaussmeter is located in proximity of a singular point of the OZ axis defined by the presence of a null field, at a point where the average value of the magnetic field along OZ during displacement of the moving component is weak and preferably lower than ±20 mT and is approximately equal to the field which causes alternation of the integrated circuit that is connected to the Hall-effect gaussmeter, and in that the pane of the Hall layer of the Hall-effect gaussmeter is arranged between the plane passing by the front side of the magnet which is closest to the moving component and the parallel plane tangential to the moving component, at a distance from the front plane of the magnet at least equal to the thickness of the protective envelope of the Hall layer;

wherein the magnet has a cavity located near the axis which is perpendicular to the displacement axis of the moving component passing by the Hall-effect gaussmeter;

wherein the magnet is comprised of a disk shaped magnet perforated at least partially by a coaxial cylindrical cavity;

wherein the Hall-effect gaussmeter is positioned on an ordinate z on the OZ axis so that the induction

$$B_{total}/B_r=B_{solid\ magnet}/B_r-B_{virtual\ magnet}/B_r+B_{plug\ magnet}/B_r$$

which is approximately equal to the oscillation value of the integrated electronic circuit connected to the Hall-effect gaussmeter when the air gap increases,

where:

B_{total} is the component of the induction along OZ the origin O of the axes, beginning from which the distance z is measured, is located on the side of the magnet closest to the tooth;

B_r designates the residual induction;

$B_{solid\ magnet}$ designates the induction of virtual magnet which is not perforated, cylindrical in particular, in which the external dimensions correspond to the external dimensions of the permanent magnet;

$B_{virtual\ magnet}$ designates the induction of a virtual magnet whose external dimensions correspond to the internal dimensions of the cavity;

$B_{plug\ magnet}$ designates the induction of a virtual magnet whose section corresponds to the internal section of the cavity, and whose height corresponds to the difference between the actual magnet and the depth of the cavity.

5,814,986

COIL RETAINER/POSITIONER FOR INDUCTIVE PROXIMITY SENSOR

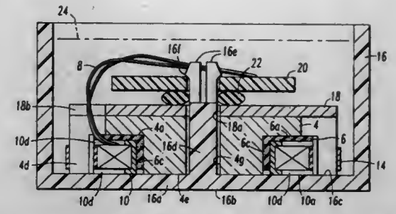
Mark A. Goskowicz, Milwaukee, Wis.; Timothy A. Christensen, Camano Island, Wash., and James H. Sager, Bayside, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 18, 1997, Ser. No. 819,276

Int. Cl.[6] G01B *7/14;* **G01R** *33/00;* **H01F** *27/30;41/00*

U.S. Cl. 324—207.26 **19 Claims**

1. An inductive proximity sensor comprising;



a non-magnetic housing having a generally planar internal surface;

a magnetic core comprising a base and a cylindrical center boss projecting from said base;

an electrical coil having an axial opening therethrough, an axial dimension of said coil being less than an axial dimension of said center boss from said base to a distal face of said boss;

resilient means disposed between said base and said coil positioning said coil beyond said distal face of said boss;

said core and said coil being disposed in said housing wherein said coil and said distal face of said boss are held firmly against said internal surface, compressing said resilient means.

5,814,987

APPARATUS FOR AND METHOD OF NUCLEAR RESONANCE TESTING

John Alec Sydney Smith, London, and Martin Blanz, Culham, both of United Kingdom, assignors to British Technology Group Limited, London, England

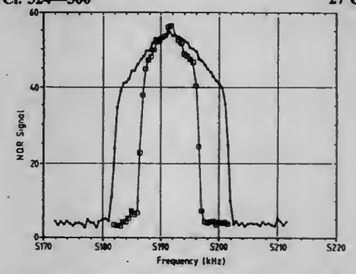
PCT No. PCT/GB94/02070, § 371 Date Mar. 25, 1996, § 102(e) Date Mar. 25, 1996, PCT Pub. No. WO95/09368, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 23, 1994, Ser. No. 619,466

Claims priority, application United Kingdom, Sep. 27, 1993, 9319875

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—300 **27 Claims**



1. Apparatus for Nuclear Quadrupole Resonance (NQR) testing a sample, comprising:

means for applying excitation to the sample;

means for detecting the response signal; and

control means adapted to control the excitation applying means to apply excitation to the sample to excite NQR resonance, the excitation comprising at least one excitation pulse, each excitation pulse covering a selected excitation frequency range, the phase of each excitation pulse varying generally non-linearly with the excitation frequency over the selected range, the control means further being adapted to control the detecting means to detect the NQR response signal.

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5,814,988

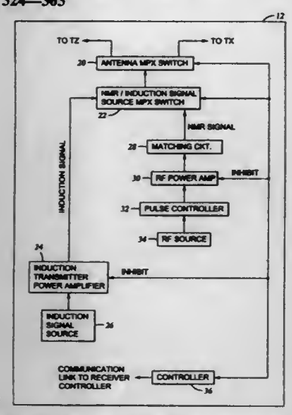
COMBINATION NUCLEAR MAGNETIC RESONANCE AND ELECTROMAGNETIC INDUCTION RESISTIVITY WELL LOGGING INSTRUMENT AND METHOD

Gregory B. Itskovich, and Stanislav Forgang, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jan. 29, 1997, Ser. No. 790,922

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—303 **21 Claims**



1. An apparatus for measuring induction resistivity and nuclear magnetic resonance properties of earth formations penetrated by a wellbore, comprising:

a magnet for inducing a static magnetic field in said earth formations;

a first antenna having a principal magnetic axis substantially perpendicular to a principal direction of said static magnetic field;

receiver antennas positioned at spaced apart locations from said first antenna;

means for generating radio frequency power pulses selectively connected to said first antenna; and

means for measuring voltages induced in said first antenna and induced in said receiver antennas, selectively connected to said first and to said receiver antennas, said means for measuring adapted to measure voltages induced in said receiver antennas during said radio frequency power pulses wherein said voltages are induced by electromagnetic induction in said earth formations, said means for measuring voltages adapted to measure voltages in said first antenna between successive ones of said power pulses wherein said voltages are induced by nuclear magnetic resonance.

5,814,989

METHODS AND APPARATUS FOR NQR TESTING

John Alec Syndney Smith, London, England; Julian David Shaw, Encinitas, Calif., and Martin Blanz, Culham, England, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB92/01004, § 371 Date Mar. 28, 1994, § 102(e) Date Mar. 28, 1994, PCT Pub. No. WO93/05693, PCT Pub. Date Apr. 1, 1993

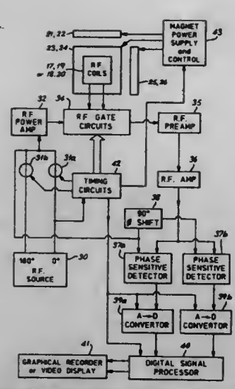
PCT Filed Jun. 4, 1992, Ser. No. 162,002

Claims priority, application United Kingdom, Jun. 7, 1991, 9112290

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—300 **12 Claims**

1. A method of detecting the presence of a particular substance containing quadrupolar nuclei, comprising:



irradiating the substance to excite nuclear quadrupole resonance at a plurality of resonance frequencies,

detecting response signals at each of the resonance frequencies, and

providing an alarm signal in dependence on whether nuclear quadrupole resonance is detected at each of the plurality of resonance frequencies.

5,814,990

METHOD FOR COMPENSATING DC VOLTAGE OFSETS IN MEASUREMENT CHANNELS FOR NUCLEAR MAGNETIC RESONANCE SIGNALS AND ARRANGEMENT FOR THE IMPLEMENTATION OF THE METHOD

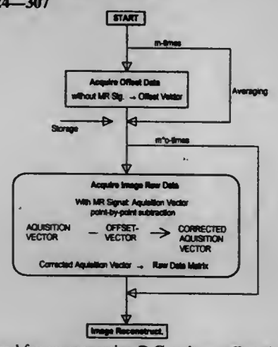
Piotr Wielopolski, Rotterdam, Netherlands, and Franz Schmitt, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 28, 1997, Ser. No. 847,718

Claims priority, application Germany, Apr. 25, 1996, 196 16 552.0

Int. Cl.[6] G01R *33/54*

U.S. Cl. 324—307 **7 Claims**



1. A method for compensating D.C. voltage offsets in a measurement channel for nuclear magnetic resonance signals wherein the signals, for acquiring image information, are sampled n-times in respective chronological measurement windows with a sampling grid that is non-equidistant in the time domain and wherein the resulting samples are digitized to produce n raw data entries per measurement window, said method comprising the steps of:

(a) sampling and digitizing an output signal of said measurement channel in at least one measurement window without a nuclear magnetic resonance signal and with a same sampling grid as for the acquisition of image information, thereby obtaining n offset data entries, and storing said n offset data entries in an offset vector; and

(b) subtracting the n offset data stored in the offset vector from the chronologically allocated n raw data entries acquired in the measurement window.

5,814,991

MAGNETIC RESONANCE TOMOGRAPHY METHOD WITH SCREENING OF SIGNALS FROM TISSUES WITH LONG TRANSVERSE RELAXATION TIMES

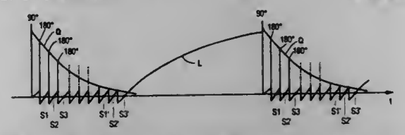
Michael Deimling, Moehrendorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 14, 1997, Ser. No. 843,267

Claims priority, application Germany, Apr. 24, 1996, 196 16 387.0

Int. Cl.[6] G01R *33/20;* **A61B** *5/055*

U.S. Cl. 324—309 **10 Claims**



1. A method for operating a nuclear magnetic resonance tomography apparatus for examining first tissue in an examination subject having a first T2 time, the subject also containing tissue having a second T2 time which is longer than said first T2 time, said method comprising the steps of:

exciting nuclear spins in each of said first and second tissues in said subject, beginning at an excitation time, under transverse magnetization which decays with said first and second T2 time constants, obtaining a first group and a second group of locus-encoded nuclear magnetic resonance signals from said subject;

obtaining said first group of nuclear magnetic resonance signals shortly after said excitation time;

obtaining said second group of nuclear magnetic resonance signals after said first group in a time interval following said excitation time at which said second tissue having said second time constant supplies a predominant signal contribution to the nuclear magnetic resonance signals; and

reconstructing an image of said examination subject containing said first and second tissues on the basis of differences in the respective content of said first and second groups of locus-encoded nuclear magnetic resonance signals having identical locus encoding.

5,814,992

NMR PROBE HEAD WITH CRYOGENICALLY COOLED PREAMPIFIERS

Max Erick Busse-Grawitz, Zumikon, and Walter Roeck, Zürich, both of Switzerland, assignors to Spectrospin AG, Fällanden, Switzerland

Filed Dec. 3, 1996, Ser. No. 754,057

Claims priority, application European Pat. Off., Dec. 20, 1995, 95120174

Int. Cl.[6] G01N *3/00*

U.S. Cl. 324—318 **7 Claims**

1. A nuclear magnetic resonance (NMR) probe head for use in a room temperature bore of a superconducting NMR magnet cryostat to investigate a room temperature sample comprising:

a radiofrequency (RF) receiving coil surrounding the sample;

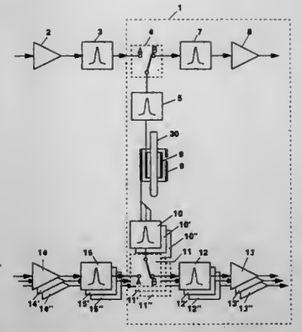
a receiving coil preamplifier connected to said receiving coil;

an additional coil surrounding said receiving coil;

an additional coil preamplifier connected to said additional coil;

cryogenic means connected to said receiving coil, said receiving coil preamplifier, said additional coil and said additional coil preamplifier for keeping said receiving coil, said receiving coil preamplifier, said additional coil and said additional coil preamplifier at a cryogenic temperature, said cryogenic means comprising liquid helium means for cooling said receiving coil and said additional and at least one of liquid nitrogen means and evaporated helium gas means for cooling said receiving coil preamplifier and said additional coil preamplifier; and

a coil filter and a transmitter-receiver switch, wherein at least one of said liquid nitrogen means and said evaporated helium gas means are adapted for cooling said coil filter and said transmitter-receiver switch.



5,814,993

MAGNET ARRANGEMENT FOR A DIAGNOSTIC NUCLEAR MAGNETIC RESONANCE APPARATUS

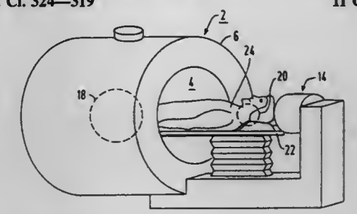
Georg Frese, Herzogenaurach, and Horst Siebold, Effeltrich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1997, Ser. No. 819,777

Claims priority, application Germany, Mar. 28, 1996, 196 12 421.2

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—319 **11 Claims**



1. A magnet arrangement for a diagnostic nuclear magnetic resonance apparatus comprising first means for generating a uniform magnet field in a first imaging volume with the first imaging volume disposed inside the first means, and second means for generating a uniform magnet field in a second imaging volume in interactive connection with the first means with said second imaging volume disposed between the first means and the second means said first and second imaging volumes being separate and independent from each other.

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5,814,994

CIRCUIT LAYOUT FOR ION CURRENT MEASUREMENT

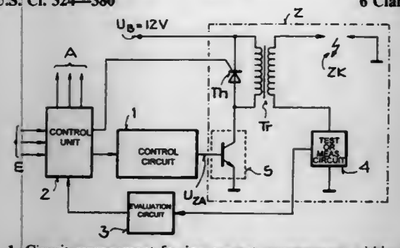
Peter Hohner, Echterdingen, and Jens Schirmer, Heilbronn, both of Germany, assignors to Temic Telefunken Microelectronic GhmB, Heilbronn, and Daimler-Benz AG, Stuttgart, both of Germany

Filed Jul. 3, 1996, Ser. No. 675,640

Claims priority, application Germany, Jul. 5, 1995, 195 24 541.5

Int. Cl.[6] F02P *17/00*

U.S. Cl. 324—380 **6 Claims**



1. Circuit arrangement for ion current measurement within the combustion chamber of an internal combustion engine, comprising:

an ignition coil complete with primary and secondary circuits,

an ignition transistor connected in the primary circuit,

a spark plug connected in the secondary circuit, which spark plug serves as ion current probe,

a control circuit which, in order to generate an ion current measurement signal in the secondary circuit, drives the ignition transistor such that an ignition trigger impulse followed by a period of a saw-toothed current signal are generated by the control circuit as the primary current of the ignition coil, and,

a measuring circuit connected to one of the primary and secondary circuits for detecting the ion current measurement signal to determine the ion current.

5,814,995

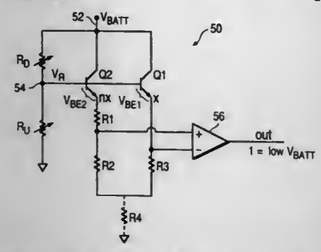
VOLTAGE DETECTOR FOR BATTERY OPERATED DEVICE

Ali Tasdighi, San Jose, Calif., assignor to TelCom Semiconductor, Inc., Mountain View, Calif.

Filed Sep. 12, 1996, Ser. No. 713,575

Int. Cl.[6] G01R *31/36;* **G01N** *27/416*

U.S. Cl. 324—431 **11 Claims**



1. A battery operated device including a voltage detector comprising:

a first terminal of a voltage detector connected to a first battery terminal and a second terminal of said voltage detector connected to a second battery terminal;

a voltage reference source in said voltage detector comprising a first node and a second node, said voltage reference source including one or more components for generating a signal with a negative temperature coefficient applied to said first node and one or more components for generating a signal with a positive temperature coefficient applied to said second node for offsetting said negative temperature coefficient, said voltage reference source further including a comparator,

said comparator having a third terminal coupled to said first node and a fourth terminal coupled to said second node; and

a voltage divider network connected between said first terminal and said second terminal for creating a divided battery voltage, a signal corresponding to said divided battery voltage being applied to said one or more components for generating a signal with a negative temperature coefficient and being applied to said one or more components for generating a signal with a positive temperature coefficient, an output of said comparator indicating when said divided battery voltage is below a threshold voltage.

5,814,996

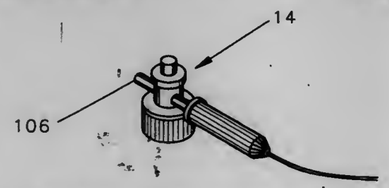
LEAKAGE DETECTOR HAVING SHIELDED CONTACTS

Robert A. Winter, Sioux Falls, S. Dak., assignor to Bowden's Automated Products, Inc., Viborg, S. Dak.

Filed Apr. 8, 1997, Ser. No. 832,193

Int. Cl.[6] A61B *17/39*

U.S. Cl. 324—510 **8 Claims**



1. A device for testing leakage from patient leads of a piece of electronic equipment, said device comprising,

a leakage testing circuit,

a Faraday shield around said testing circuit,

said testing circuit comprising a plurality of connectors, each of said connectors for receiving a lead from a piece of equipment to be tested,

a tubular Faraday shield around at least one of said connectors,

said Faraday shield around said connector being electrically connected to said Faraday shield around said testing circuit,

means for retracting said tubular Faraday shield to permit attachment of a lead to said connector.

5,814,997

SINGLE-POLE VOLTAGE DETECTOR, IN PARTICULAR FOR OVERHEAD ELECTRICAL LINES

Bernard Bouchez, Bagneux, France, assignor to Societe Anonyme des Ets Catu, Bagneux, France

Filed Aug. 3, 1995, Ser. No. 510,650

Claims priority, application France, Aug. 5, 1994, 94 09762

Int. Cl.[6] G01R *33/00*

U.S. Cl. 324—522 **13 Claims**

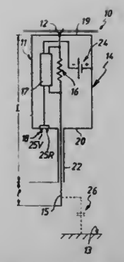
1. Single-pole voltage detector for high voltage lines, comprising:

a contact electrode cooperable with a high voltage line,

a Faraday cage, said contact electrode being fixed to and disposed outside the Faraday cage, and electrically connected thereto,

a load resistor disposed inside said Faraday cage and connected between said contact electrode and a counter-weight,

a screened electrical cable comprising a screen electrically connected to said Faraday cage and defining an electrical extension thereof, and a longitudinal wire extending longitudinally



through and beyond said screen, said counterweight defining a portion of said longitudinal wire disposed beyond a free end of said screen,

the counterweight being adapted to carry a microcurrent to the load resistor in response to a stray capacitance between the counterweight and ground, and

a detector circuit connected across the load resistor for driving at least one indicator device,

wherein the distance L between the counterweight and the contact electrode and the active surface area S of said counterweight simultaneously satisfying the following conditions:

$L>200$ mm (I)

$50\ mm^2<S<500\ mm^2$. (II)

5,814,998

DEVICE AND METHOD FOR LOCATING PARTIAL DISCHARGES WITH DETACHABLE COUPLING UNITS

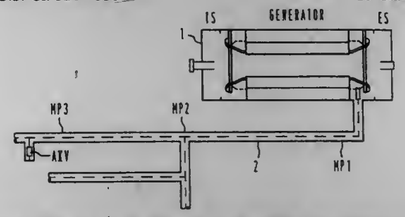
Peter Gruenewald; Juergen Weidner, both of Essen; Gerhard Schimmelpfennig, Wesel, and Reinhold Koziel, Mulheim an der Ruhr, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 30, 1996, Ser. No. 656,887

Claims priority, application Germany, Nov. 17, 1995, 295 18 286 U

Int. Cl.[6] G01R *31/08*

U.S. Cl. 324—536 **18 Claims**



4. A device for locating partial discharges in dynamoelectric high-voltage machines and/or high-voltage systems, the device comprising; at least first and second coupling units (16, 17, 18) which are coupled to mutually spaced measuring points (MP1, MP2, MP3, ES, TS AKV) of a conductor (2) of the high-voltage machine and/or high-voltage system, wherein the at least first and second coupling units couple out a high-frequency electromagnetic signal produced upon the occurrence of partial discharges; an evaluation device which is electrically connected to the at least first and second coupling units (16, 17, 18), wherein the evaluation device records as a function of time the signal coupled out by each coupling unit of the at least first and second coupling units (16, 17, 18), and wherein the evaluation device correlates at least two recordings of the signal coupled out by each of the at least first and second coupling units; and a third coupling unit (17) detachably coupled to a measuring point between the at least first and second coupling units (16, 18), wherein the third coupling unit (17) is movable to further measuring points depending on the correlation of the recorded signal coupled by each coupling unit of the at least first and second coupling units, whereby the device precisely locates the place of origin of the partial discharge.

5,814,999

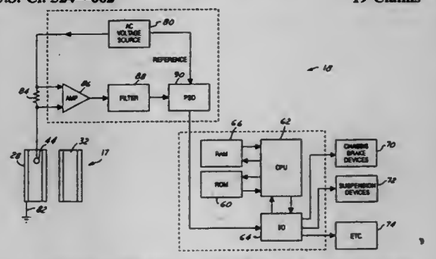
METHOD AND APPARATUS FOR MEASURING DISPLACEMENT AND FORCE

Larry Dean Elie, Ypsilanti; John Matthew Ginder, Plymouth; Joseph Steven Mark, Dearborn, and Mark Edward Nichols, Saline, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed May 27, 1997, Ser. No. 863,765

Int. Cl.[6] G01R *27/26;27/08*

U.S. Cl. 324—662 **19 Claims**



1. A transducer apparatus for measuring relative displacement, said transducer apparatus comprising:

a first structural member;

a second structural member;

a magnetorheological elastomer interposed between and connected to said first and second structural members; and

measurement means for applying a drive signal to an electrode disposed within said magnetorheological elastomer and monitoring a preselected electrical state of said magnetorheological elastomer and generating an output signal corresponding thereto in response to loads applied to said first and second structural members.

5,815,000

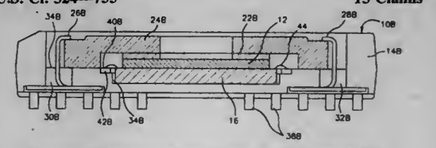
METHOD FOR TESTING SEMICONDUCTOR DICE WITH CONVENTIONALLY SIZED TEMPORARY PACKAGES

Warren M. Farnworth, Nampa; Alan G. Wood, Boise; David R. Hembree, Boise, and Salman Akram, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 398,309, Mar. 1, 1995, Pat. No. 5,512,332, which is a continuation-in-part of Ser. No. 345,064, Nov. 14, 1994, Pat. No. 5,541,525, which is a continuation-in-part of Ser. No. 124,899, Sep. 21, 1993, Pat. No. 5,495,179, which is a continuation-in-part of Ser. No. 46,675, Apr. 14, 1993, Pat. No. 5,367,253, which is a continuation-in-part of Ser. No. 973,931, Nov. 10, 1992, Pat. No. 5,302,891, which is a continuation of Ser. No. 709,858, Jun. 4, 1991, abandoned. This application Dec. 29, 1995, Ser. No. 580,687

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—755 **13 Claims**



1. A method for testing a semiconductor die, comprising:

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providing a base comprising a recess and external leads in a configuration substantially equivalent to conventional semiconductor package leads conforming to standards of a recognized industry standard setting body;

mounting an interconnect within the recess in electrical communication with the external leads, said interconnect including contact members configured to make electrical connections with contact locations on the die;

providing a spring and a cover configured to bias the die against the interconnect;

aligning the die with the interconnect and placing the contact members and contact locations in electrical contact;

attaching the cover to the base, with the spring biasing the die, and the cover contained within the recess and recessed below a surface of the base such that a size and outline of the base and attached cover is substantially equivalent to a conventional semiconductor package conforming to standards of the recognized industry standard setting body; and

testing the die by applying test signals to the external leads.

5,815,001

INTEGRATED CIRCUIT BOARD WITH BUILT-IN TERMINAL CONNECTION TESTING CIRCUITRY

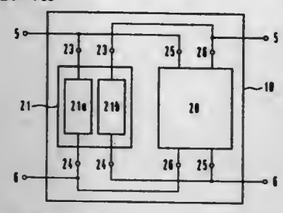
Ewald Michael, Haar, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1996, Ser. No. 617,125

Claims priority, application European Pat. Off., Mar. 16, 1995, 95103681

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—763 **9 Claims**



1. A board, comprising:

two integrated circuits each having first terminals, second terminals, one basic configuration and one test configuration;

said basic configurations containing components performing functions during normal operation of said integrated circuits for which a particular circuit is intended;

each of said basic configurations having an input being connected to one of said first terminals and another input being connected to one of said second terminals of one of said integrated circuits, and each of said basic configurations having an output being connected to one of said first terminals and another output being connected to one of said second terminals of one of said integrated circuits;

each of said test configurations having inputs and at least one output, each of said inputs of said test configurations being connected to a respective one of said first terminals for supplying test signals applied to said first terminals to said test configuration, during a test mode of each of said integrated circuits;

each of said at least one output of said test configurations being connected to a respective one of said second terminals for transmitting result signals from said test configuration to said second terminals, as a function of the test signals;

the test and result signals being unaffected by said basic configurations during application of the test and result signals;

first board contact surfaces each being connected to a respective one of said first terminals, for applying the test signals to a respective one of said first board contact surfaces having an electrical connection with a respective one of said first terminals to be tested;

second board contact surfaces each being connected to a respective one of said second terminals, for picking up the result signals at said second board contact surfaces;

one of said first terminals of both of said integrated circuits being electrically connected together for simultaneously testing through a respective one of said first board contact surfaces; and

said second terminals associated with said first terminals through said test configurations being electrically separated from one another.

5,815,002

METHOD AND DEVICE OF TESTING SEMICONDUCTOR INTEGRATED CIRCUIT CHIP CAPABLE OF PREVENTING ELECTRON-HOLE PAIRS

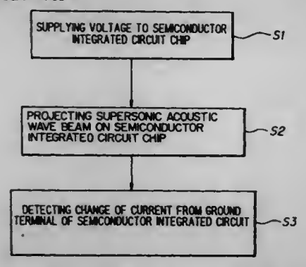
Kiyoshi Nikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 28, 1996, Ser. No. 653,834

Claims priority, application Japan, May 26, 1995, 7-128049

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—765 **2 Claims**



1. A method of testing a semiconductor integrated circuit chip, comprising the steps of:

projecting a supersonic acoustic wave beam as a heat source on said semiconductor integrated circuit chip while a voltage is supplied to a semiconductor integrated circuit in said semiconductor integrated circuit chip; and

detecting a change of a current in said semiconductor integrated circuit while said semiconductor integrated circuit chip is supplied and heated with said supersonic acoustic wave beam.

5,815,003

PROGRAMMABLE LOGIC INTEGRATED CIRCUITS WITH PARTITIONED LOGIC ELEMENT USING SHARED LAB-WIDE SIGNALS

Bruce B. Pedersen, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 334,879, Nov. 4, 1994, abandoned. This application Jun. 30, 1995, Ser. No. 497,632

Int. Cl.[6] H03K *7/38*

U.S. Cl. 326—39 **26 Claims**

1. A configurable electronic device comprising:

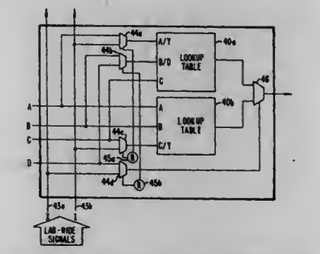
a plurality of logic elements grouped into a plurality of logic blocks wherein at least one of said logic blocks comprises outputs and an array of local interconnection lines within said logic block;

a plurality of shared input signals connectable to a plurality of logic elements in at least one logic block; and

at least one logic element comprising:

an output and a plurality of inputs wherein said output is a logical function of said inputs; and

at least two look-up tables said look-up tables having inputs selectively connectable to said inputs of said logic element and having outputs selectively connectable to said output of said logic element;



a general interconnect structure programmably connecting the outputs of one of said logic blocks to said array of local interconnection lines of another of said logic blocks.

5,815,004

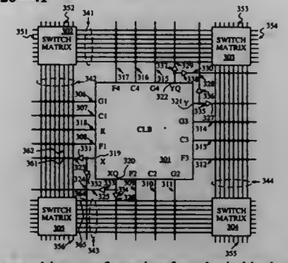
MULTI-BUFFERED CONFIGURABLE LOGIC BLOCK OUTPUT LINES IN A FIELD PROGRAMMABLE GATE ARRAY

Stephen M. Trimberger, and Khue Duong, both of San Jose, Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Oct. 16, 1995, Ser. No. 543,591

Int. Cl.[6] H03K *7/38;19/177*

U.S. Cl. 326—41 **21 Claims**



1. An output driver configuration for a logic block comprising:

a first buffer coupled to an output port of the logic block for driving an output signal;

a second buffer coupled to the output port of the logic block for driving the output signal;

a first output line coupled to the first buffer;

means for programmably coupling the first output line to one of a critical interconnect path and a non-critical interconnect path for the output signal;

a second output line coupled to the second buffer; and

means for programmably coupling the second output line to one of a critical interconnect path and a non-critical interconnect path for the output signal.

5,815,005

POWER REDUCTION CIRCUITS AND SYSTEMS FOR DYNAMIC LOGIC GATES

Patrick W. Bosshart, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1996, Ser. No. 684,369

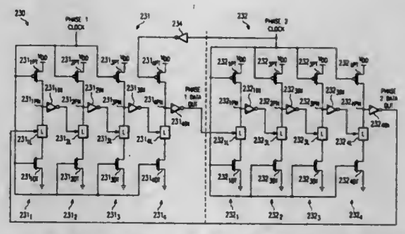
Int. Cl.[6] H03K *19/096*

U.S. Cl. 326—95 **27 Claims**

2. A logic circuit, comprising:

a first chase dynamic logic circuit comprising one or more dynamic logic stages;

a second chase dynamic logic circuit comprising one or more dynamic logic stages;



wherein each of said one or more dynamic logic stages comprises:

a precharge node;

a coupling device which when conducting couples said precharge node to a precharge voltage during a precharge chase;

a discharge path connected to said precharge node which when conducting couples said precharge node to a voltage different than the precharge voltage during an evaluate phase; and

an output for presenting a logic value responsive to a voltage at said precharge node;

and further comprising control circuitry for controlling at least one of said dynamic logic stages as a storing stage such that said coupling device and said discharge path of said storing stage are concurrently not conducting during a predetermined time such that the logic value is maintained at said output;

wherein the predetermined time is equal to or greater than a time period equal to said evaluate phase plus said precharge phase;

wherein said control circuitry is further for controlling all of said dynamic logic stages in addition to said storing stage;

wherein said first phase dynamic logic circuit comprises said storing stage; and

wherein said circuitry for controlling comprises:

circuitry for generating a first clock signal occurring over clock cycles;

circuitry for coupling the first clock signal to control said coupling device of each of said one or more dynamic logic stages of said first phase dynamic logic circuit other than said coupling device of said storing stage;

circuitry for generating a second clock signal occurring over clock cycles;

circuitry for coupling the second clock signal to control said coupling device of each of said one or more dynamic logic stages of said second phase dynamic logic circuit; and

circuitry for coupling a signal complement of the second clock signal to control said coupling device of said storing stage.

5,815,006

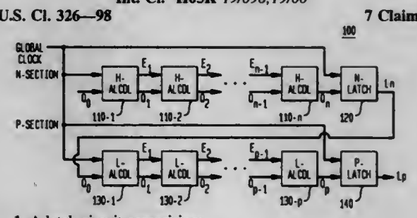
SINGLE TRANSITION PER EVALUATION PHASE LATCH CIRCUIT FOR PIPELINED TRUE-SINGLE-PHASE SYNCHRONOUS LOGIC CIRCUIT

Hong-Yi Huang, Changhua, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Apr. 25, 1996, Ser. No. 634,891

Int. Cl.[6] H03K *19/096;19/00*

U.S. Cl. 326—98 **7 Claims**



1. A latch circuit comprising:

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an enable circuit, responding to clock pulse levels of a first polarity by outputting an enabling voltage of a second polarity opposite to said first polarity, and

first and second inverters which each comprises an output, a first biasing input connected to a first polarity voltage, a first input, a second biasing input receiving said enabling voltage and a second input, wherein each inverter drives said respective output to a voltage of said first polarity in response to receiving a signal of said second polarity at said first input and drives said respective output to a voltage of said second polarity in response to receiving a signal of said first polarity at said second input,

wherein said first input of said first inverter receives, between each edge of said clock pulse levels of said first polarity, a signal to be stored, and otherwise receives a signal of said first polarity, said second input of said first inverter is connected to an output of said second inverter, said first input of said second inverter receives, between each edge of said clock pulse levels of said first polarity, a complement of said signal to be stored, and otherwise receives a signal of said first polarity, and said second input of said second inverter is connected to said output of said first inverter, so that signals outputted from said first and second inverters transition from said first polarity to said second polarity no more than once during each clock pulse level of said first polarity.

5,815,007

MORE-THAN-ONE DETECTOR

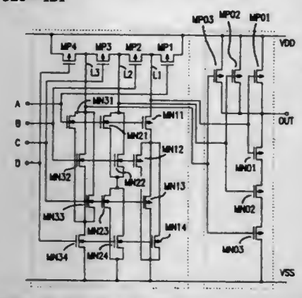
Tatsuya Saito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 632,391

Claims priority, application Japan, Apr. 12, 1995, 7-086722

Int. Cl.[6] H03K *19/094;19/082*

U.S. Cl. 326—121 **2 Claims**



1. A detector for detecting simultaneous occurrence of more than one of the same logic out of n input signals, n being an integer larger than two; comprising:

a serial connection of n first type switching transistors, both ends of said serial connection connected to a first terminal of a power supply and each of said first type switching transistors gated by each of the n input signals respectively;

n−1 sets of two stage cascaded connection provided between a second terminal of said power supply and n−1 connections of said n first type transistors respectively,

a first set of said n−1 sets of two stage cascaded connection comprising a stage of a second type switching transistor gated by a first signal of the n input signals and a stage of a parallel connection of n−1 second type switching transistors gated by the latter n−1 signals of the n input signals,

a last set of said n−1 sets of said two stage cascaded connection comprising a stage of n−1 second type switching transistors gated by the first n−1 signals of the n input signals and a stage of a second type switching transistor gated by a last signal of the n input signals, and

each i-th set of said n−1 sets of said two stage cascaded connections comprising a stage of a parallel connection of i second type switching transistors gated by the first i signals of the n input signals and a stage of a parallel connection of n-i second type switching transistors gated by the latter n-i signals of the n input signals, i being an integer more than one and smaller than n−1; and

a NAND gate of n−1 inputs, each of said n−1 inputs connected to said n−1 connections of said n first type switching transistors.

5,815,008

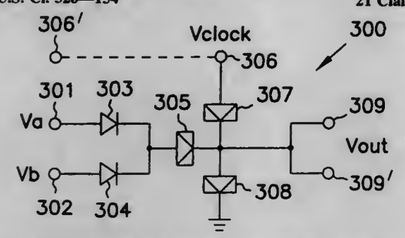
RESONANT TUNNELING DIODE STRUCTURES FOR FUNTIONALLY COMPLETE LOW-POWER LOGIC

William Williamson, III, and Barry Kent Gilbert, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Continuation of Ser. No. 534,955, Sep. 28, 1995, Pat. No. 5,698,997. This application Jun. 5, 1997, Ser. No. 869,547

Int. Cl.[6] H03K *19/10;19/01*

U.S. Cl. 326—134 **21 Claims**



1. A semiconductor structure for performing any predetermined logic function of a complete logic family at high speed and low power, comprising:

a plurality of inputs each having a separate terminal for an input signal and an isolating device coupled from said separate input terminal to the isolating device of others of said inputs to form a common input node;

a transfer resonant tunnel diode having an anode coupled to said common input node and having a cathode coupled to an output node;

a clock terminal for receiving a clock waveform;

a latch having load and storage resonant tunnel diodes, said load resonant tunnel diode having an anode coupled to said clock terminal and a cathode coupled to an output node, said storage resonant tunnel diode having an anode coupled to said output node and a cathode coupled to a ground potential;

an output terminal coupled to said output node for producing at least one output signal; and

wherein the current/voltage relationships of the isolating devices and the resonant tunnel diodes are selected to determine the logical function implemented by the semiconductor.

5,815,009

PROCESS TOLERANT DELAY CIRCUIT HAVING PROCESS SENSITIVE AND PROCESS INSENSITIVE COMPONENTS PLACED THEREIN

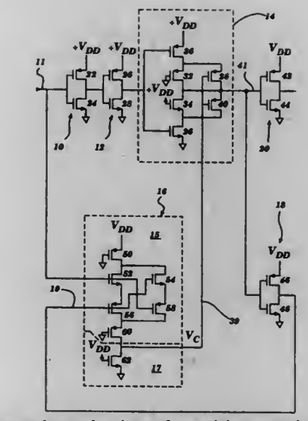
Joseph Andrew Iadanza, Hinesburg, Vt., and Makoto Ueda, Kyoto, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 646,899, May 8, 1996, Pat. No. 5,663,670, which is a division of Ser. No. 402,280, Mar. 10, 1995, Pat. No. 5,548,237. This application Dec. 30, 1996, Ser. No. 777,429

Int. Cl.[6] H03D *13/00*

U.S. Cl. 327—5 **15 Claims**

6. A transitional, zero standby current, process sense stack comprising:



primary and secondary inputs for receiving respective signals of high or low states;

transition means for determining a voltage different between the primary and secondary inputs;

divider means for dividing a fixed signal;

wherein, said divider means divides said fixed signal when a voltage differential is present between said primary and secondary inputs as determined by said transition means; and

said divider means provides a division ratio based upon the effects of a process by which said divider means was fabricated;

wherein said divider means comprises:

first resistance means for providing a given resistance value;

process sensitive resistance means electrically coupled in series with said first resistance means, said process sensitive resistance means presenting a process dependent resistance in series with said first resistance means, the process dependent resistance having a resistance value dependent upon said process by which it was fabricated;

said fixed voltage being applied across a series circuit including said first resistance means and said process sensitive resistance means with a divided output of said fixed voltage provided therebetween;

wherein the process sensitive resistance means includes a minimum channel length FET that has a channel length representative of said process by which it was fabricated, said minimum channel length FET being electrically coupled in series with said first resistance means; and

wherein said first resistance means comprises a long channel length FET electrically coupled in series with said process sensitive resistance means.

5,815,010

Patent Not Issued For This Number

5,815,011

CIRCUIT FOR ADJUSTING THE CORING THRESHOLD OF A SIGNAL

Mark A. Schultz, Carmel, Ind., assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

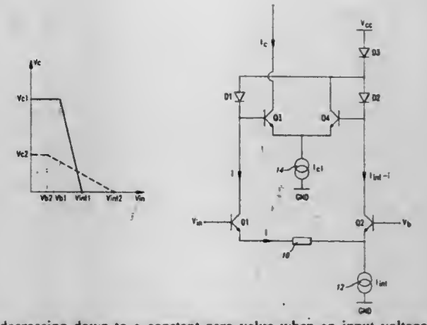
Filed Jan. 10, 1996, Ser. No. 587,328

Claims priority, application France, Jan. 13, 1995, 95 00604

Int. Cl.[6] H02N *5/217;* **H03K** *17/16*

U.S. Cl. 327—89 **16 Claims**

1. A circuit for providing an output signal having a portion with a constant maximum amplitude followed by a decreasing portion



decreasing down to a constant zero value when an input voltage increases from zero, the circuit comprising:

an asymmetrical differential stage having first and second branches respectively controlled by the input voltage and a breakpoint voltage corresponding to a beginning of the decreasing portion, and being connected such that all the current of said asymmetrical differential stage flows in said second branch of said asymmetrical differential stage when the input voltage is below said breakpoint voltage and progressively flows into said first branch of said asymmetrical differential stage when the input voltage increases above said breakpoint voltage;

a first current source which establishes the current of said asymmetrical differential stage, the current corresponding to an end of the decreasing portion;

a symmetrical differential stage having a first branch controlled by said first branch of said asymmetrical differential stage and providing the output signal, said symmetrical differential stage having a second branch controlled by said second branch of said asymmetrical differential stage; and

means for establishing a current of the symmetrical differential stage at a value corresponding to the maximum amplitude.

5,815,012

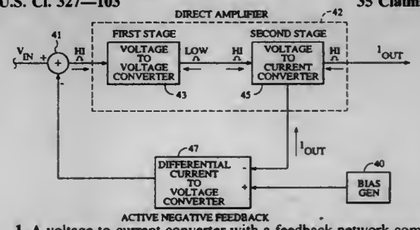
VOLTAGE TO CURRENT CONVERTER FOR HIGH FREQUENCY APPLICATIONS

Roberto Rivoir, Bari, and Franco Maloberti, Torre d'Isola, both of Italy, assignors to Atmel Corporation, San Jose, Calif.

Filed Aug. 2, 1996, Ser. No. 691,562

Int. Cl.[6] H02M *11/00*

U.S. Cl. 327—103 **35 Claims**



1. A voltage-to-current converter with a feedback network comprising:

a direct amplifier having an input voltage node, a reference voltage node and an output node, said direct amplifier being effective for generating an output current on said output node, said output current being proportional to a voltage difference between said input voltage node and said reference voltage node, said output current having a DC output current component and an AC output current component;

a current-to-voltage converter responsive to said output current and being effective for generating a feedback voltage signal

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proportional only to said AC output current component, said feedback voltage signal being coupled to said reference voltage node of said direct amplifier; and

means for generating a bias signal proportional to said DC output current component, and said current-to-voltage converter further having a first and a second differential input, said first differential input being coupled to receive said bias signal, said current-to-voltage converter including a differential amplifier having a local feedback network and having a local gain magnitude independent of said direct amplifier, said differential amplifier having an output lead coupled to said reference voltage node and having a first and second input lead responsive to said first and second differential inputs, respectively.

5,815,013

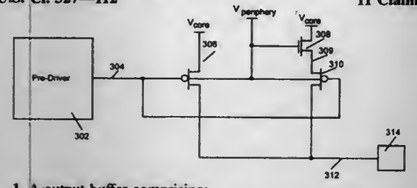
SELF BACK-BIAS COMPENSATING P-DRIVER FOR MULTIPLE VOLTAGE SWITCHING ENVIRONMENTS

Robert James Johnston, Fair Oaks, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 18, 1996, Ser. No. 718,146

Int. Cl.[6] H03B *1/00*

U.S. Cl. 327—112 **11 Claims**



1. A output buffer comprising:

a first current source, having at least two control inputs, coupled between a first power supply and an output node; and

a second current source, having at least two control inputs, coupled between the first power supply and the output node;

wherein the second current source provides current to the output node when the voltage of one of the two control inputs is greater than the voltage of the first power supply and, wherein the second current source comprises a PFET coupled in series with an NFET.

5,815,014

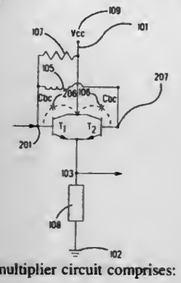
TRANSISTOR BASED FREQUENCY MULTIPLIER

Xiangdong Zhang, Nashua, N.H., and Yong-Hoon Yun, Acton, Mass., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 27, 1996, Ser. No. 753,627

Int. Cl.[6] H03B *19/00;* **H03L** *7/00*

U.S. Cl. 327—122 **18 Claims**



1. A frequency multiplier circuit comprises:

an input port and an output port, said input port receiving an input signal having a frequency F_1 and said output port transmitting a signal having a frequency nF_1 wherein n is an even integer,

first and second transistors, each transistor having a base, emitter, and collector, the emitters of each transistor commoned and connected to said output port, the collectors of each transistor commoned and connected to a voltage source, the base of the first transistor receiving said input signal, and the base of said second transistor connected to the base of said first transistor through an inductor, the second transistor having a junction capacitance C_{bc} between the base and the collector, wherein said inductor value is chosen to form a resonant circuit with said junction capacitance for providing a 180 degrees chase shift between the input signal at the bases of the first and second transistors at said frequency F_1.

5,815,015

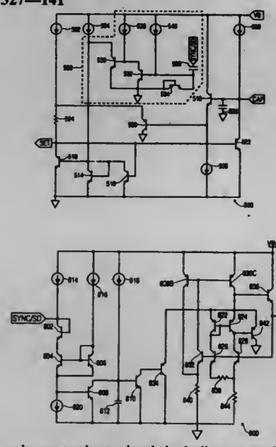
SYNCHRONIZATION AND SHUTDOWN CIRCUITS AND METHODS IN HIGH-SPEED SWITCHING REGULATOR DRIVE CIRCUITS

Carl T. Nelson, San Jose, and Robert Essaff, Fremont, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Continuation of Ser. No. 228,478, Apr. 15, 1994, Pat. No. 5,672,988. This application Sep. 29, 1997, Ser. No. 939,310

Int. Cl.[6] H03L *7/00*

U.S. Cl. 327—141 **5 Claims**



1. In a voltage regulator circuit including a transistor switch for connection to a load and an oscillator circuit, a circuit for performing synchronization and shutdown functions from a single input node, the circuit comprising:

a synchronization circuit coupled to the oscillator circuit and to the single input node, such that the application of a synchronization signal to the input node causes the regulator circuit to be driven at a frequency determined by the synchronization signal rather than the natural frequency of the regulator circuit;

a shutdown circuit coupled to input node, the shutdown circuit operating such that the application of a low signal causes the shutdown signal to be applied to the regulator circuit; and

a protection circuit which prevents the regulator circuit from being driven into a shutdown state when a synchronization signal applied to the input node goes periodically low.

5,815,016

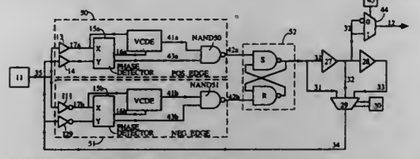
PHASE-LOCKED DELAY LOOP FOR CLOCK CORRECTION

Charles R. Erickson, Fremont, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 632,523, Apr. 12, 1996, Pat. No. 5,646,564, which is a continuation of Ser. No. 300,608, Sep. 2, 1994, abandoned. This application Jun. 14, 1996, Ser. No. 665,169

Int. Cl.[6] H03L *7/00;* **H03K** *5/00*

U.S. Cl. 327—158 **2 Claims**



1. A phase-locked loop, comprising:

a positive phase detector including a first terminal connected to receive a reference input clock signal, and a second terminal connected to receive an output clock feedback signal, said positive phase detector producing a positive phase detector output signal indicative of a phase difference between a positive edge of said reference input clock signal and a positive edge of said output clock feedback signal;

at least one voltage controlled delay element connected to receive said positive phase detector output signal, said voltage controlled delay element producing a positive output clock signal with a positive edge that is delayed from said positive edge of said reference input clock signal by an amount related to said positive phase detector output signal;

a negative phase detector including a first terminal connected to receive said reference input clock signal, and a second terminal connected to receive said output clock feedback signal, said negative phase detector producing a negative phase detector output signal indicative of a phase difference between a negative edge of said reference input clock signal and a negative edge of said output clock feedback signal;

at least one voltage controlled delay element connected to receive said negative phase detector output signal, said voltage controlled delay element producing a negative output clock signal with a negative edge that is delayed from said negative edge of said reference input clock signal by an amount related to said negative phase detector output signal; and

an output clock signal generator for generating an output clock signal having a positive clock edge in phase with said positive edge of said positive output clock signal and a negative clock edge in phase with said negative edge of said negative output clock signal, said output clock feedback signal being derived from said output clock signal.

5,815,017

FORCED OSCILLATOR CIRCUIT AND METHOD

Duncan A. McFarland, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1997, Ser. No. 808,772

Int. Cl.[6] H03L *7/06;* **H03H** *11/26*

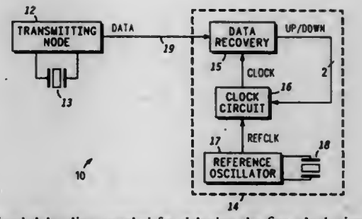
U.S. Cl. 327—158 **17 Claims**

1. An integrated circuit, comprising:

a variable delay line coupled for receiving a first clock signal and providing a variable delay clock signal in response to a programming signal;

a phase detector having a first input coupled for receiving the variable delay clock signal and a second input coupled for receiving a fixed delay clock signal;

a programmable counter having a control input coupled to an output of the phase detector, and an output for providing the programming signal; and



a fixed delay line coupled for delaying the first clock signal to produce the fixed delay clock signal at an output.

5,815,018

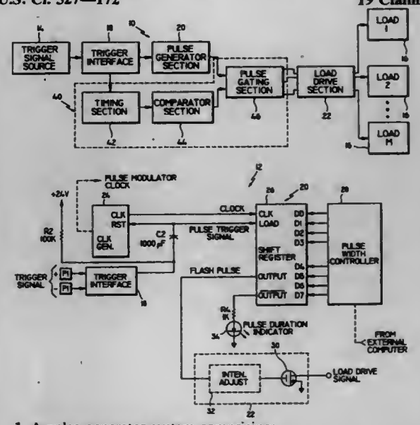
PULSE MODULATOR CIRCUIT FOR AN ILLUMINATOR SYSTEM

Michael L. Soborski, Hightstown, N.J., assignor to Systech Solutions, Inc., Cranbury, N.J.

Filed Jul. 16, 1996, Ser. No. 680,955

Int. Cl.[6] H03K *3/017;7/08*

U.S. Cl. 327—172 **19 Claims**



1. A pulse generator system comprising:

a trigger interface having an input connected to an external trigger source, and configured to generate a pulse trigger signal in response to a trigger signal from the external trigger source;

a clock generator responsive to said pulse trigger signal and configured to generate a plurality of clock signals including a flash pulse clock signal and a duty cycle clock signal;

a flash pulse generator responsive to said flash pulse clock signal and to at least one user definable input signal such that said flash pulse generator generates a flash pulse signal to enable activation of a plurality of external loads;

a timing section responsive to said duty cycle clock signal and configured to output duty cycle count data;

a comparison section configured to compare said timing section output duty cycle count data with duty cycle count data defined by a user and to generate at least one output comparison output signal;

a gating section configured to receive said flash pulse signal and said at least one comparison output signal, and to output a plurality of load drive signals; and

a load drive section having a plurality of load drivers wherein each load driver corresponds to one of the plurality of external loads, for selectively driving the plurality of loads.

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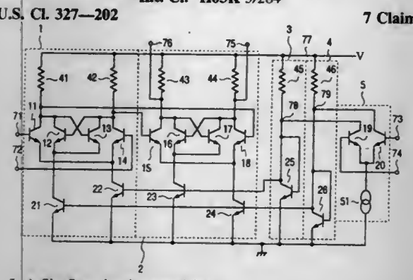
5,815,019

FLIP-FLOP CIRCUIT OPERATING ON LOW VOLTAGE

Gohiko Uemura, and Jun Yoshida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 23, 1996, Ser. No. 710,860
Claims priority, application Japan, Oct. 9, 1995, 7-261168
Int. Cl.[6] H03K *3/284*
U.S. Cl. 327—202 **7 Claims**



1. A flip-flop circuit comprising:

a master side circuit receiving a data signal and including two differential circuits, two loads and two current sources, said current sources being activated by receiving respective bias voltages to produce and supply currents to said loads and said differential circuits;

a slave side circuit coupled to said master side circuit and including two differential circuits, two loads and two current sources, said current sources being activated by receiving respective bias voltages to produce and supply currents to said loads and said differential circuits;

a first bias circuit producing a first voltage which is to be supplied to one of said current sources of said master side circuit and one of said current sources of said slave side circuit as respective bias voltages;

a second bias circuit producing a second voltage which is to be supplied to the other of said current sources of said master side circuit and the other of said current sources of said slave side circuit as respective bias voltages; and

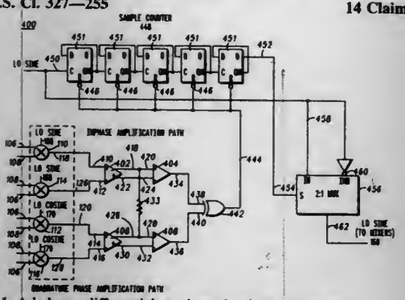
a control circuit including a differential circuit coupled to said first and second bias circuits, said differential circuit receiving a clock signal and controlling said first and second bias circuits to produce said first and second voltages in a complementary manner.

5,815,020

BALANCE DIFFERENTIAL RECEIVER

Steven Peter Allen, Mesa, and William Chunhung Yip, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1996, Ser. No. 718,733
Int. Cl.[6] H03H *11/16*
U.S. Cl. 327—255 **14 Claims**



1. A balance differential receiver circuit, comprising:

quadrant detector means, operably coupled to a pair of inputs, a first of the pair of inputs coupled to an in-phase signal and a second of the pair of inputs coupled to a quadrature phase signal, for detecting a phase relationship between the in-phase signal and the quadrature signal; and

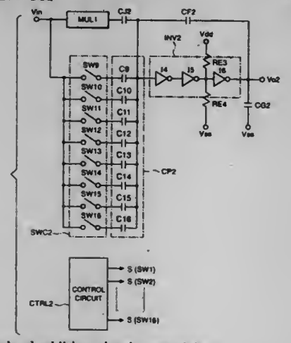
quadrant rotation means, having a selection input operably coupled to the quadrant detector means, for switching between a local oscillator signal and an inverse local oscillator signal.

5,815,021

WEIGHT ADDITION CIRCUIT

Guoliang Shou; Changming Zhou; Kazunori Motohashi; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Jul. 26, 1996, Ser. No. 686,761
Claims priority, application Japan, Jul. 28, 1995, 7-212420
Int. Cl.[6] G06G *7/14;7/16*
U.S. Cl. 327—361 **6 Claims**



1. A weighted addition circuit comprising:

i) a first switch circuit having a plurality of switches connected in parallel to an input voltage;

ii) a first capacitive coupling having a plurality of capacitances respectively connected to outputs of said switches of said first switch circuit, the outputs of said capacitances forming an integrated output;

iii) a first inverted amplifying portion having an odd number of MOS inverters connected in series, said first inverted amplifying portion being connected to said integrated output of said first capacitive coupling;

iv) a first feedback capacitance for connecting an output of said first inverted amplifying portion to an input of said first inverted amplifying portion;

v) a first control circuit for closing each of said switches of said first switch circuit;

vi) a second switch circuit having a plurality of switches connected in parallel to said input voltage and corresponding to said switches of said first switch circuit;

vii) a second capacitive coupling having a plurality of capacitances corresponding to said capacitances of said first capacitive coupling and respectively connected to outputs of said switches of said second switch circuit, the outputs of said capacitances of said second capacitive coupling forming a second integrated output;

viii) a second inverted amplifying portion having an odd number of MOS inverters connected in series, said second inverted amplifying portion being connected to said second integrated output of said second capacitive coupling;

ix) a connecting capacitance for connecting an input of said second inverted amplifying portion and the output of said first inverted amplifying portion;

x) a second feedback capacitance for connecting an output of said second inverted amplifying portion to the input of said second inverted amplifying portion; and

xi) a second control circuit for closing each of said switches in said first and second switch circuits;

wherein a capacity of said second feedback capacitance is set equal to a sum of a capacities of said second capacitive coupling and also equal to a capacity of said connecting capacitance.

5,815,022

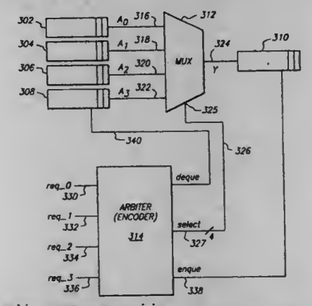
Patent Not Issued For This Number

5,815,023

UNBALANCED MULTIPLEXER AND ARBITER COMBINATION

Thomas P. Webber, Petersham, Mass., and Ting-Chuck Chiang, Sunnyvale, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 20, 1997, Ser. No. 821,266
Int. Cl.[6] H03K *17/62*
U.S. Cl. 327—407 **19 Claims**



1. An arbiter system comprising:

an unbalanced multiplexer including a plurality of multiplexer inputs, a select input, and a plurality multiplexer signal paths each extending from an associated one of said multiplexer inputs to an output of said multiplexer, wherein time characteristics of each of said multiplexer signal paths are unequal; and

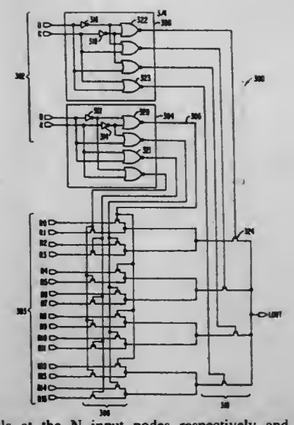
an arbiter coupled to receive a plurality of request signal values which prompt said arbiter to control said multiplexer, via a select signal, to select one of said multiplexer inputs, said arbiter requiring a request signal transfer time to provide a select signal value corresponding to each of said plurality of request signal values.

5,815,024

LOOK-UP TABLE USING MULTI-LEVEL DECODE

Srinivas T. Reddy, Santa Clara, and Anil Gupta, San Jose, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 591,121, Jan. 25, 1996, which is a continuation of Ser. No. 335,628, Nov. 8, 1994, abandoned, which is a continuation of Ser. No. 76,712, Jun. 11, 1993, Pat. No. 5,438,295. This application Apr. 4, 1997, Ser. No. 833,363
Int. Cl.[6] H03K *17/62;17/693*
U.S. Cl. 327—408 **18 Claims**



18. A look up table circuit including:

a first stage including a set of N input nodes and a sub-set of intermediate nodes, the first stage configured to receive input signals at the N input nodes respectively and to pass a selected sub-set of the input signals to the intermediate nodes;

a first decoder, coupled to the first stage, and configured to select the sub-set of input signals in response to the state of a first group of select signals, the first decoder further configured to provide first enable signals to the first stage to enable the first stage to pass the selected sub-set of input signals to the intermediate nodes, wherein the first decoder includes a plurality of logic gates coupled to receive all the possible combinations of the first group of select signals and their complements respectively;

a second stage, coupled between the intermediate nodes of the first stage and an output node of the look up table circuit, the second stage configured to receive the selected sub-set of the input signals at the intermediate nodes and to pass a selected one input signal among the sub-set of input signals to the output node; and

a second decoder, coupled to the second stage, and configured to select the selected one input signal among the sub-set of input signals in response to the state of a second group of select signals, the second decoder further configured to provide second enable signals to the second stage to enable the second stage to pass the selected one input signal to the output node.

5,815,025

INTENSITY CONTROLLING CIRCUIT DEVICE FOR LED-ARRAY HEAD HAVING A PLURALITY OF LED-ARRAY CHIPS

Shinichi Kubota, Minoo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 248,671, May 25, 1994, Pat. No. 5,517,151. This application Oct. 20, 1995, Ser. No. 546,121
Claims priority, application Japan, May 26, 1993, 5-123901
Int. Cl.[6] H01L *30/00*
U.S. Cl. 327—514 **6 Claims**

1. In an intensity controlling circuit device used for an LED-array head having at least one light-emitting means having a plurality of LEDs and corresponding slave transistors, an intensity controlling circuit connected to the respective light-emitting means so as to control intensity of light beams emitted by the LEDs, said intensity controlling circuit comprising:

a) a first transistor;

b) a constant current generating means for generating a constant current flowing in said first transistor so as to contribute to formation of an LED-intensity-determining voltage which controls a current output from said slave transistors; and

c) intensity adjusting means having:

1) at least one second transistor connected in parallel to said first transistor, between a power source and said constant

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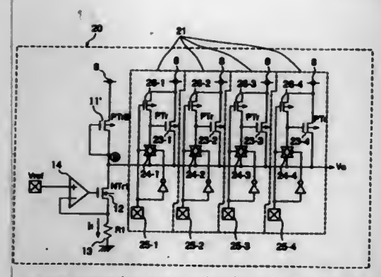


current generating means, wherein each of said at least one second transistor contributes or does not contribute to formation of the LED-intensity-determining voltage based on the respective second transistor's on state or off state;

2) controlling means for controlling the respective on/off state(s) of said at least one second transistor so as to adjust the LED-intensity-determining voltage to thereby adjust an on-state LED intensity common to those of said LEDs which are in an "on" state; and

3) an output, responsive to the LED-intensity-determining voltage determined by said constant current generating means, by said first transistor, and by said at least one second transistor, and connected to each of said slave transistors in the light-emitting means.

5,815,026

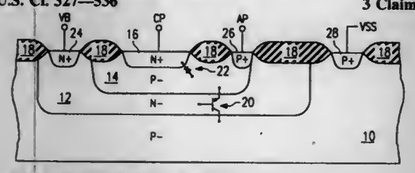
HIGH EFFICIENCY, HIGH VOLTAGE, LOW CURRENT CHARGE PUMP

Giovanni Santin; Giulio Marotta, both of Rieti, Italy, and Michael C. Smayling, Missouri City, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1996, Ser. No. 684,607

Int. Cl.[6] H02M *3/18;7/00*

U.S. Cl. 327—536 **3 Claims**



1. A voltage multiplier, comprising:

a semiconductor substrate of a first conductivity type;

a diode, having a first voltage applied to a first port thereof, said diode

comprising:

a first well of a second conductivity type formed in said substrate, being connected to a second voltage,

a second well of said first conductivity type formed in said first well, having an electrical contact point comprising said first port of said diode, and

a third well of said second conductivity type formed in said second well, having an electrical contact point comprising a second port of said diode; and

a capacitor, having a first contact thereof connected to said second port of said diode and having a pulse signal voltage at a third voltage connected to a second contact of said capacitor;

wherein said second voltage has a value of said first voltage or higher, such that the emitter-base junction of a parasitic transistor formed by said substrate, said first well and said second well is not forward biased, and wherein said pulsed signal drives said second port of said diode to said first voltage, minus the forward bias voltage drop of said diode, plus said third voltage.

5,815,027

CIRCUIT CONFIGURATION FOR DETECTING A LOAD CURRENT OF A POWER SEMICONDUCTOR COMPONENT WITH A SOURCE-SIDE LOAD

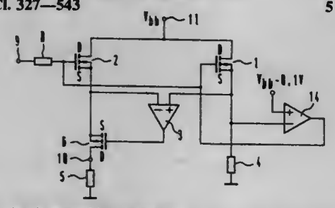
Jenoe Tihanyi, Kirchheim, Germany, and Adam-Istvan Koroncai, Klagenfurt, Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 7, 1996, Ser. No. 660,500

Claims priority, application Germany, Jun. 7, 1995, 195 20 735.1

Int. Cl.[6] G01R *19/165*

U.S. Cl. 327—543 **5 Claims**



1. A circuit assembly, comprising:

a field-effect-controllable power semiconductor component having a drain terminal, a source terminal, a gate terminal, a drain-to-source voltage and a load current; and

a circuit configuration for detecting the load current of said field-effect-controllable power semiconductor component, said circuit configuration including:

a further field-effect-controllable semiconductor component through which a fraction of the load current flows, said further field-effect-controllable semiconductor component having a drain terminal connected to the drain terminal of said field-effect-controllable power semiconductor component, a gate terminal connected to the gate terminal of said field-effect-controllable power semiconductor component, a source terminal and a drain-to-source voltage,

a fixed potential terminal,

one resistor at which a voltage proportional to the load current can be picked up, said one resistor being connected to said fixed potential terminal, and

a controllable resistor connected between said one resistor and the source terminal of said further field-effect-controllable semiconductor component, said controllable resistor adjusting the current of said further field-effect-controllable semiconductor component for setting the drain-to-source voltages of said field-effect-controllable power semiconductor component and said further field-effect-controllable semiconductor component equal to one another,

a differential amplifier having a first input connected to the source terminal of said field-effect-controllable power semiconductor component, a second input connected to the source terminal of said further field-effect-controllable semiconductor component and an output, said controllable resistor being a MOSFET having a control input connected to the output of said differential amplifier, and

a further differential amplifier having a first input connected to the source terminal of said field-effect-controllable power semiconductor component and a second input receiving a voltage being greater than an offset voltage of said differential amplifier connected to said controllable resistor.

5,815,028

METHOD AND APPARATUS FOR FREQUENCY CONTROLLED BIAS CURRENT

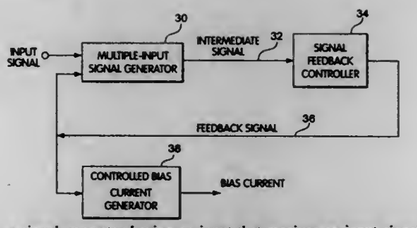
David C. Reynolds, Dove Canyon, Calif., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 16, 1996, Ser. No. 714,198

Int. Cl.[6] H03K *3/01*

U.S. Cl. 327—543 **64 Claims**

20. A bias circuit for providing a bias current to an integrated circuit having an operating speed, the bias circuit comprising:



a signal generator having an input that receives an input signal that has a frequency indicative of the operating speed of the integrated circuit, and an output that provides an intermediate signal indicative of the operating speed;

a controllable bias current generator, coupled to the signal generator, having an input that receives to the intermediate signal, and an output that provides a bias current having a magnitude that is a function of the frequency of the input signal; and

a feedback controller, having an input that receives the intermediate signal and an output that provides a feedback signal indicative of the operating speed to the input of the controllable bias current generator and to a second input of the signal generator, wherein the feedback controller includes:

a window comparator, having an input that receives the intermediate signal and an output providing a control signal indicative of whether the intermediate signal is within a predetermined range; and

a binary counter, having an input that receives the control signal, and an output that provides a resistance control signal as the feedback signal in response to the control signal.

5,815,029

SEMICONDUCTOR CIRCUIT AND SEMICONDUCTOR CIRCUIT DEVICE

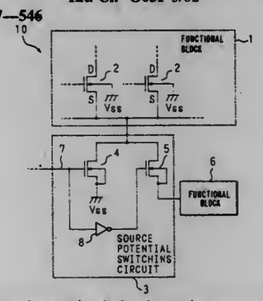
Hirotsugu Matsumoto, Tokyo, Japan, assignor to Mitsubishi Denki Kabsuhiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 572,023, Dec. 14, 1995, abandoned. This application Jul. 18, 1997, Ser. No. 897,036

Claims priority, application Japan, Aug. 10, 1995, 7-204793

Int. Cl.[6] G05F *3/02*

U.S. Cl. 327—546 **10 Claims**



1. A semiconductor circuit for decreasing power consumption, comprising:

a functional block including at least one FET having source and drain electrodes, one of which is downstream of current flowing through said at least one FET and the other is upstream of said current when operational;

potential supply means for supplying one of a first potential and a second potential to said electrode which is downstream of said current of the at least one FET;

switching means, connected to said electrode which is downstream of said current of the at least one FET and the potential supply means, for supplying said electrode which is downstream of said current of the at least one FET with one of the first and second potentials supplied by the potential supply means; and

an input line connected to said switching means for selecting said one of the first and second potentials, said first potential being used when said at least one FET device is in an operational state and said second potential being used when said at least one FET device is in a stand-by state, said second potential being larger in magnitude than said first potential.

5,815,030

CIRCUIT FOR FILTERING A SIGNAL AND INTEGRATED CIRCUIT COMPRISING SUCH A CIRCUIT

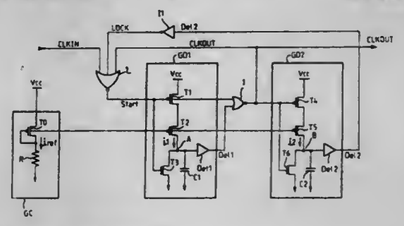
Sylvie Wuidart, Pourrieres, and Tien-Dung Do, Aix-en-Provence, both of France, assignors to SGS-Thomson Microelectronics, S.A., Gentilly Cedex, France

Continuation of Ser. No. 286,485, Aug. 4, 1994, Pat. No. 5,467,053. This application Jul. 28, 1995, Ser. No. 507,905

Claims priority, application France, Aug. 5, 1993, 93-09680

Int. Cl.[6] H03K *3/017;5/14*

U.S. Cl. 327—551 **25 Claims**



1. A circuit comprising:

first and second stages, each said stage comprising

a first MOS-type transistor having a first source/drain terminal connected to a constant voltage source,

a second MOS-type transistor having a first source/drain terminal connected to a second source/drain terminal of its respective said first transistor, and having a gate being connected to a reference current generator,

a capacitor connected between a second constant voltage source and a second source/drain terminal of its respective said second transistor,

a third MOS-type transistor connected in parallel to said capacitor;

a first logic circuit connected to receive a circuit input signal, a circuit output signal, and a first signal corresponding to said second source/drain terminal of said second transistor of said second stage, and connected to provide a first activation signal to the gates of said first and third transistors of said first stage; and

a second logic circuit connected to receive said first activation signal and a second signal corresponding to said second source/drain terminal of said second transistor of said first stage, and connected to provide said circuit output signal, said circuit output signal being connected to provide a second activation signal to the gates of said first and third transistors of said second stage.

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5,815,031

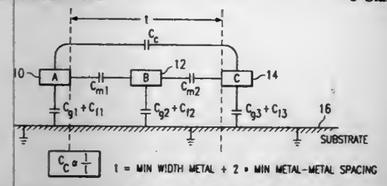
HIGH DENSITY DYNAMIC BUS ROUTING SCHEME

Teik-Chung Tan; Stephen C. Kromer, both of Austin, and Joe Peters, Buda, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 655,679, Jun. 3, 1996, abandoned, which is a continuation of Ser. No. 140,671, Oct. 21, 1993, abandoned. This application Jun. 19, 1997, Ser. No. 878,682

Int. Cl.[6] H03B *1/00;* **H03K** *17/16;17/62*

U.S. Cl. 327—551 **6 Claims**



1. In an apparatus having dynamic signal lines for carrying dynamic signals, wherein said dynamic signals are part of a dynamic data bus, an improved signal line routing scheme comprising:

a plurality of dynamic signal lines disposed in parallel to each other;

at least one static signal line disposed parallel to and between at least two of said plurality of dynamic signal lines; and

said at least one static signal line disposed immediately adjacent to at least one of said at least two dynamic signal lines such that the distance between the at least one static signal line and said at least two dynamic signal lines is selected so as to minimize the capacitance between said at least two dynamic signal lines.

5,815,032

SEMICONDUCTOR DEVICE CAPABLE OF PREVENTING FLUCTUATIONS OF SUBSTRATE POTENTIAL

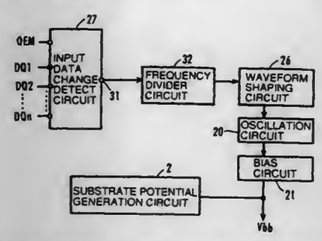
Takuya Ariki; Hiroshi Akamatsu, and Shigeru Mori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1996, Ser. No. 694,440

Claims priority, application Japan, Feb. 6, 1996, 8-019620

Int. Cl.[6] H03K *3/01*

U.S. Cl. 327—534 **8 Claims**



1. A semiconductor integrated circuit inputting/outputting data in response to an internal signal, comprising:

a semiconductor substrate;

substrate voltage generating means for generating a predetermined potential to be supplied to said semiconductor substrate;

detecting means for detecting a change in logic level of input data; and

substrate potential holding means for generating a voltage to be supplied to said semiconductor substrate in response to detection of a change in said detecting means thereby to prevent fluctuation in the potential of said semiconductor substrate.

5,815,033

INTEGRATED CIRCUIT, VARIABLE FILTER ADJUSTING METHOD THEREFOR, AND ELECTRONIC EQUIPMENT USING THE SAME

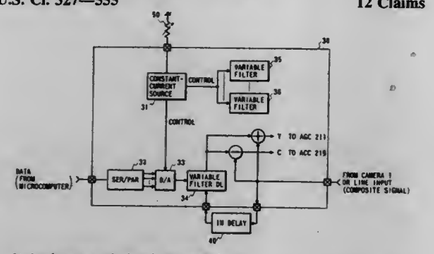
Katsuhito Sakurai, Hadano; Takahiro Shirai, Isehara; Yasushi Matsuno, Atsugi, and Nobuyuki Hirayama, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1996, Ser. No. 627,114

Claims priority, application Japan, Apr. 7, 1995, 7-082214

Int. Cl.[6] H03B *1/00*

U.S. Cl. 327—555 **12 Claims**



1. An integrated circuit comprising:

first adjustment means for adjusting disordered response characteristics and/or temperature characteristics of elements integrated within the circuit and for adjusting a control signal;

conversion means for performing digital/analog conversion of the control signal adjusted by said first adjustment means into a reference signal based on data input from an external circuit; and

second adjustment means for adjusting disordered response characteristics of an element externally connected to the circuit in accordance with the reference signal.

5,815,034

CAPACITIVE COUPLING CIRCUIT WITH DIODE-BIASED DIFFERENTIAL AMPLIFIER

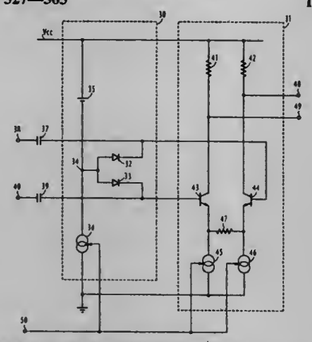
Norihito Takahashi, Yamagata, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Apr. 24, 1997, Ser. No. 839,946

Claims priority, application Japan, Apr. 25, 1996, 8-105218

Int. Cl.[6] H03F *3/45*

U.S. Cl. 327—563 **14 Claims**



1. A capacitive coupling circuit comprising:

a bias circuit including first and second diodes and means for forward-biasing said first and second diodes and producing bias voltages at the cathode terminals of the first and second diodes, said bias circuit having an impedance of substantially infinite value across said cathode terminals;

first and second capacitive elements for respectively applying input voltages to the cathode terminals of said first and second diodes; and

a differential amplifier including first and second transistors having controlling terminals respectively connected to the cathode terminals of said first and second diodes for receiving said bias voltages via said diodes and said input voltages via said capacitive elements and for developing a differential output voltage across a controlled terminal of the first transistor and a controlled terminal of the second transistor.

5,815,035

DEMODULATING CIRCUIT, DEMODULATING APPARATUS, DEMODULATING METHOD, AND MODULATING/DEMODULATING SYSTEM OF ACOUSTIC SIGNALS

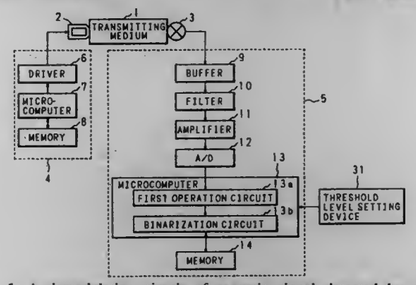
Shinichi Yamagishi, and Noritaka Egami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Japan

Filed Mar. 13, 1997, Ser. No. 816,376

Claims priority, application Japan, Sep. 26, 1996, 8-254466

Int. Cl.[6] H03D *1/00;* **H04L** *27/06;* **G01V** *3/00*

U.S. Cl. 329—311 **13 Claims**



1. A demodulating circuit of acoustic signal detected by a vibration sensor, the acoustic signal being emitted from an acoustic signal transmitter in a waveform modulated by pulse signal, and propagated through a transmitting medium, comprising:

a first operation circuit for calculating an amplitude peak value by a predetermined formula from two values of an amplitude in a time interval corresponding to a phase difference of 90 degrees of said pulse signal;

a threshold level setting device for setting a threshold level for said amplitude peak value; and

a binarization circuit for demodulating said amplitude peak value by binarization on the basis of said threshold level.

5,815,036

APPARATUS AND METHOD FOR CONTROLLING FEEDFORWARD AMPLIFIER

Yoshishige Yoshikawa, Ibaraki; Hiroaki Kosugi, Hirakata; Hisashi Adachi, Minou, and Kazuo Nagao, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

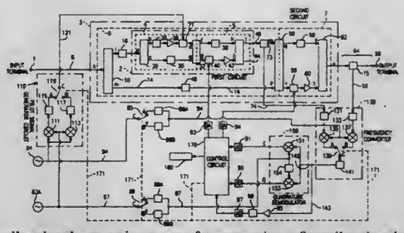
Filed Jul. 19, 1996, Ser. No. 684,384

Claims priority, application Japan, Jul. 20, 1995, 7-183680

Int. Cl.[6] H03F *3/66*

U.S. Cl. 330—52 **15 Claims**

1. An apparatus for controlling a feedforward amplifier having a first circuit and a second circuit; said first circuit having a main amplifier and a first and a second vector adjuster and operates at a first frequency; said second circuit having a signal input terminal and a third and a fourth vector adjuster and operates at a second frequency, comprising:



pilot signal generating means for generating a first pilot signal of said first frequency and a second pilot signal of said second frequency,

injection means for injecting one of said first and second pilot signal into the output of said main amplifier,

extraction means for sampling an output signal of said first circuit,

frequency conversion means for extracting said first pilot signal from said extraction means and for producing a first low-range converted pilot signal,

quadrature demodulation means for demodulating the first low-range converted pilot signal into I and Q signal components,

monitor signal producing means for producing a pilot monitor signal, and

control means for receiving the I and Q signal from said quadrature demodulation means and the pilot monitor signal from said monitor signal producing means, and producing a plurality of control signals for adjusting said second and fourth vector adjusters so as to maintain a minimal amplitude level of said pilot monitor signals.

5,815,037

HIGH-PASS FILTER, PARTICULARLY FOR CANCELING OUT THE OFFSET IN A CHAIN OF AMPLIFIERS

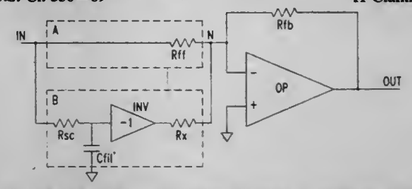
Luciano Tomasini, Monza; Rinaldo Castello, Arcore; Ivan Bietti, Casalromano, and Giancarlo Clerici, Vimodrone, all of Italy, assignors to SGS-Thomson Microelectronics S.R.L., Agrate Brianza, Italy

Filed May 21, 1996, Ser. No. 651,106

Claims priority, application European Pat. Off., May 22, 1995, 95830217

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—69 **11 Claims**



1. A method of selectively passing frequency components of an input signal, comprising:

producing a first transferred signal proportional to the input signal by supplying the input signal to a first branch having a substantially constant gain;

producing a first low-pass signal having a cut-off frequency by supplying the input signal to a second branch having a low-pass response; and

subtracting the first low-pass signal from the first transferred signal to produce a first output signal by providing the first low-pass and first transferred signals to a common terminal at the inverting input of an operational amplifier.

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5,815,038

DISTORTION COMPENSATION CIRCUIT

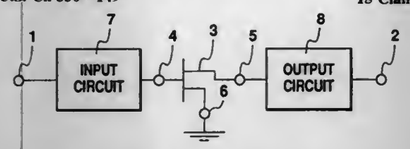
Satoshi Ogura; Kiyoharu Seino; Tomohiko Ono; Akihiro Kamikokura, and Haruzo Hirose, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1996, Ser. No. 635,710

Claims priority, application Japan, Apr. 28, 1995, 7-105923; Oct. 2, 1995, 7-255071

Int. Cl.[6] H03F *1/26*

U.S. Cl. 330—149 18 Claims



1. A distortion compensation circuit comprising:

a semi-conductor element having a gate, source and drain; and

an input circuit and an output circuit which are connected to the semi-conductor element, wherein the input circuit is connected to the gate, the output circuit is connected to one of the drain and source, the other of the drain and source not connected to the output circuit is grounded, and an external direct current (D.C.) bias is not applied to any of the gate, source or drain of the semi-conductor element.

5,815,039

LOW-VOLTAGE BIPOLAR OTA HAVING A LINEARITY IN TRANSCONDUCTANCE OVER A WIDE INPUT VOLTAGE RANGE

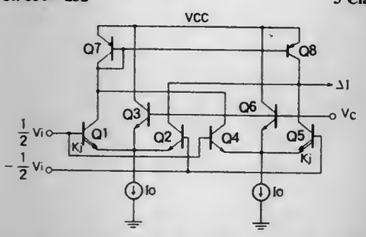
Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 22, 1996, Ser. No. 684,618

Claims priority, application Japan, Jul. 21, 1995, 7-186089; Mar. 21, 1996, 8-064344

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—252 5 Claims



1. A bipolar OTA (operational transconductance amplifier) including a plurality of triple-tail cells each of which comprises a transistor pair of first and second transistors forming a differential input/output pair and a third transistor applied with a control voltage, said transistor pair and said third transistor being driven by a common tail current, said OTA comprising means for applying a dc offset voltage to an input signal of said differential input/output pair, said plurality of triple-tail cells having outputs connected in parallel.

5,815,040

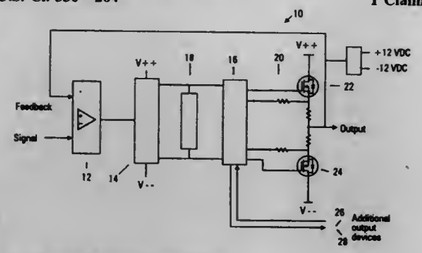
WIDE BANDWIDTH, CURRENT SHARING, MOSFET AUDIO POWER AMPLIFIER WITH MULTIPLE FEEDBACK LOOPS

Anthony T. Barbetta, 5301 Commerce Ave. #5, Moorpark, Calif. 93021, assignor to Anthony T. Barbetta, Moorpark, Calif.

Filed Dec. 30, 1996, Ser. No. 774,537

Int. Cl.[6] H03F *3/30*

U.S. Cl. 330—264 1 Claim



1. An audio amplifier comprising:

a voltage feedback amplifier stage having an audio signal input;

a push-pull voltage gain/phase splitter stage driven from said voltage feedback amplifier stage;

a bias adjustment stage driven from said push-pull voltage gain/phase splitter stage;

a current drive stage driven from said bias adjustment stage;

an output stage driven from said current drive stage, said output stage comprising a plurality of paralleled current shared individual MOS output transistors driving an output node;

an output load having a first terminal connected to said output node and a second terminal connected to a fixed voltage potential;

a first voltage feedback loop comprising a voltage feedback stage having an input connected to a voltage divider driven from said first terminal of said load and an output connected to a feedback input node in said voltage feedback amplifier stage;

a second voltage feedback loop comprising a voltage feedback stage having an input connected to said output node and an output connected to a feedback input node in said push-pull voltage gain/phase splitter stage; and

a third feedback loop comprising a current feedback stage having an input in series between said output node and said load and an output connected to a feedback input node in said voltage feedback amplifier stage.

5,815,041

HIGH-SPEED AND HIGH-PRECISION PHASE LOCKED LOOP HAVING PHASE DETECTOR WITH DYNAMIC LOGIC STRUCTURE

Kyeongho Lee, Seoul, and Deog-kyoon Jeong, Kyungki-do, both of Rep. of Korea, assignors to Silicon Image, Inc., Cupertino, Calif.

Filed Apr. 12, 1996, Ser. No. 631,420

Int. Cl.[6] H03L *7/089;* H03K *5/13*

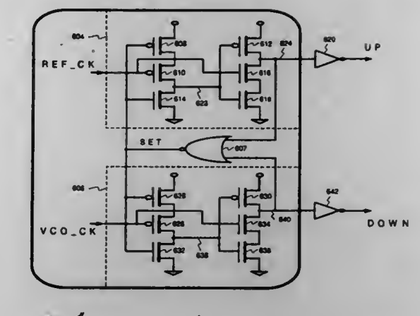
U.S. Cl. 331—8 6 Claims

1. A phase frequency detector comprising:

a first transistor of a first type having a source, having a drain, and having a gate for receiving a set signal;

a second transistor of a first type having a source coupled to the drain of the first transistor of the first type, having a drain, and having a gate for receiving a reference clock signal;

a first transistor of a second type having a source coupled to the drain of the second transistor of the second type, having a drain, and having a gate for receiving the set signal;



a third transistor of a first type having a source, having a drain, and having a gate coupled to the drain of the second transistor of the first type;

a second transistor of a second type having a source coupled to the drain of the third transistor of the first type, having a drain, and having a gate for receiving the reference clock signal;

a third transistor of a second type having a source coupled to the drain of the second transistor of the second type, having a drain, and having a gate coupled to the gate of the third transistor of the first type;

a fourth transistor of a first type having a source, having a drain, and having a gate for receiving the set signal;

a fifth transistor of a first type having a source coupled to the drain of the fourth transistor of the first type, having a drain, and having a gate for receiving a VCO clock signal;

a fourth transistor of a second type having a source coupled to the drain of the fifth transistor of the first type, having a drain, and having a gate for receiving the set signal;

a sixth transistor of a first type having a source, having a drain, and having a gate coupled to the drain of the fifth transistor of the first type;

a fifth transistor of a second type having a source coupled to the drain of the sixth transistor of the first type, having a drain, and having a gate for receiving a VCO clock signal;

a sixth transistor of a second type having a source coupled to the drain of the fifth transistor of the second type, having a drain, and having a gate coupled to the gate of the sixth transistor of the first type; and

a reset circuit having a first input coupled to the drain of the third transistor of the first type, having a second input coupled to the drain of the sixth transistor of the first type, and having an output for generating the set signal.

5,815,042

DUTY CYCLED CONTROL IMPLEMENTED WITHIN A FREQUENCY SYNTHESIZER

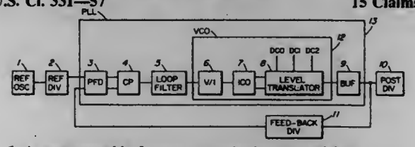
Hugh Chow, Thornhill; David Glen, North York, and Ray Chau, Toronto, all of Canada, assignors to ATI Technologies Inc., Ontario, Canada

Filed Apr. 18, 1996, Ser. No. 634,399

Claims priority, application Canada, Oct. 3, 1995, 2159762

Int. Cl.[6] H03B *1/00*

U.S. Cl. 331—57 15 Claims



1. A programmable frequency synthesizer comprising:

(a) a phase locked loop (PLL) including a current controlled oscillator (ICO),

(b) a level translator for receiving output signals from the ICO wherein the output signals have a finite slew rate,

(c) a reference source of signals,

(d) a phase-frequency detector for receiving signals from said reference source and output signals generated by the level translator and for providing pulse signals to the ICO having pulse widths which are directly proportional to phase difference between the signals from the reference source and the output signals from the level translator, and

(e) means for varying the slew rate of the output signals from the ICO wherein the duty cycle and thus the frequency of output signals of the level translator may be varied.

5,815,043

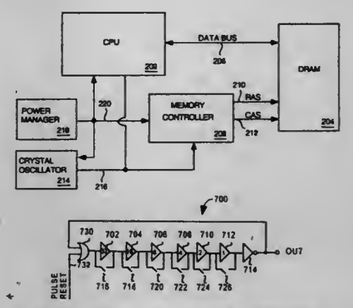
FREQUENCY CONTROLLED RING OSCILLATOR HAVING BY PASSABLE STACKS

Wing Hong Chow, and Robert L. Bailey, both of San Jose, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 13, 1997, Ser. No. 800,160

Int. Cl.[6] H03B *27/00*

U.S. Cl. 331—57 22 Claims



1. A frequency controlled ring oscillator, comprising:

a ring oscillator having a number of delay stages, said ring oscillator produces an output clock signal having an output frequency;

a plurality of bypass switches, each of said bypass switches being coupled across one of the delay stages of said ring oscillator; and

a controller for comparing the output frequency of the output clock signal with a reference frequency to produce a comparison result, and for opening or closing said bypass itches based on the comparison result.

5,815,044

VARIABLE-REACTANCE CIRCUIT

Atsusi Ogawa, Chigasaki, and Tsuneyuki Murayama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 14, 1996, Ser. No. 698,261

Claims priority, application Japan, Aug. 28, 1995, 7-219020

Int. Cl.[6] H03B *5/12;* H03H *11/00*

U.S. Cl. 331—117 R 17 Claims

1. A variable-reactance circuit comprising:

a first bipolar transistor having a base, an emitter connected to a first power-supply terminal by a first resistor, and collector connected to the base and also to a second power-supply terminal by a first constant-current source;

a second bipolar transistor having an emitter connected to said first power-supply terminal by a second resistor, a base connected to the base of said first bipolar transistor, and a

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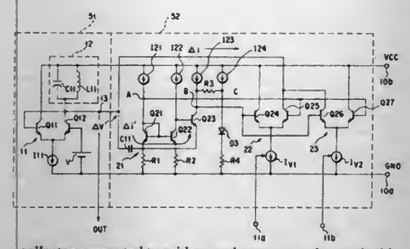


collector connected to said second power-supply terminal by a second constant-current source;

a third bipolar transistor having an emitter connected to the emitter of said first bipolar transistor, a base connected to the collector of said second bipolar transistor, and a collector connected to a bias means;

a differential section having at least one bipolar transistor pair, said bipolar transistor pair including a fourth bipolar transistor having a base connected to the collector of the third transistor, and a fifth bipolar transistor having a base connected to the collector of the first transistor, one of the transistors of said bipolar transistor pair having a collector connected to an oscillator, the transistors of said bipolar transistor pair having an emitter connected to the first power-supply terminal through a variable-current source; and

a capacitor connected between the emitter of said first bipolar transistor and the output node of the oscillator.

5,815,045

OSCILLATION APPARATUS

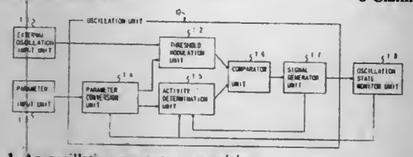
Miyuki Koyanagi; Takeo Yasukawa, and Koichi Murakami, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 14, 1996, Ser. No. 645,752

Claims priority, application Japan, Aug. 21, 1995, 7-211899

Int. Cl.[6] H03L *7/08*

U.S. Cl. 331—143 **8 Claims**



1. An oscillation apparatus comprising:

present value generating means for generating a present value which is continuously increased or decreased from an initial value with the passage of time;

threshold value generating means for generating a threshold having a value which is periodically varied independently varied to the present value;

comparing and detecting means for comparing the present value generated in said present value generating means with the threshold generated in said threshold value generating means and detecting when the present value has reached the threshold;

present value reset means for resetting the present value to the initial value whenever said comparing and detecting means detects that the present value has reached the threshold; and

signal generating means for sequentially generating signals having a period defined by a time interval between occurrences of said comparing and detecting means detecting that the present value has reached the threshold.

5,815,046

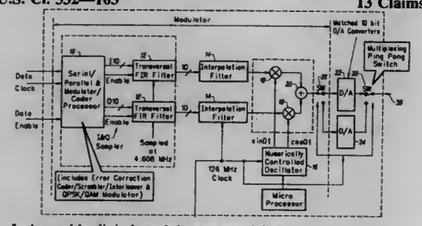
TUNABLE DIGITAL MODULATOR INTEGRATED CIRCUIT USING MULTIPLEXED D/A CONVERTERS

James J. Spilker, Jr., Woodside, and James D. McVey, Palo Alto, both of Calif., assignors to Stanford Telecom, Sunnyvale, Calif.

Filed Feb. 11, 1997, Ser. No. 797,361

Int. Cl.[6] H04L *27/20;27/36;* **H03M** *1/08*

U.S. Cl. 332—103 **13 Claims**



1. A tunable digital modulator comprising

a processor for receiving and modulating a digital data stream to provide a modulated data stream,

a mixer driven by a numerically controlled oscillator for receiving the modulated digital data stream and up-converting the frequency of the modulated digital data stream, and

a converter for receiving and converting the up-converted modulated digital data stream to analog form, said converter including a first digital-to-analog converter, a second digital-to-analog converter, a first switch for alternately connecting the up-converted modulated digital data stream to inputs of the first and second digital-to-analog converters, and a second switch for alternately connecting analog signals from outputs of the first and second digital-to-analog converters to a modulator output.

5,815,047

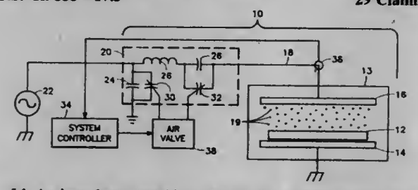
FAST TRANSITION RF IMPEDANCE MATCHING NETWORK FOR PLASMA REACTOR IGNITION

Carl A. Sorensen, Morgan Hill; Wendell T. Blonigan, Fremont, and John White, Hayward, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 145,992, Oct. 29, 1993, abandoned. This application Nov. 27, 1995, Ser. No. 563,849

Int. Cl.[6] H03H *7/40*

U.S. Cl. 333—17.3 **29 Claims**



14. An impedance matching network for an RF plasma reactor having RF excitation apparatus receiving RF power through said impedance matching network from an RF generator to ignite and maintain a plasma in said reactor, and presenting a plasma impedance to said impedance matching network, said network comprising:

a current path including an input conductor connectable to said RF generator and an output conductor connectable to said RF excitation apparatus;

a common return connection;

at least one capacitor connected between said current path and said common return connection and having a variable capacitance value corresponding to a match to said plasma impedance during a steady state of said plasma;

means coupled to said output conductor for sensing whenever said plasma reaches said steady state;

at least a first tunable capacitor connected in parallel with said at least one capacitor, said first tunable capacitor being switchable between a high capacitance value providing a match to said plasma impedance during onset of plasma ignition, and a negligible capacitance value with respect to said high capacitance value;

a source of compressed air; and

means coupled to said first tunable capacitor for setting said first tunable capacitor to said high capacitance value prior to ignition of said plasma in said reactor and for switching said first tunable capacitor from said high to said negligible capacitance value upon said plasma reaching said steady state, wherein said means for switching includes actuator means linked to said first tunable capacitor for controlling said first tunable capacitor in response to said means for sensing, said actuator means comprising an air valve connected to said source of compressed air and governed by said means for sensing, a pneumatic rotor driven by compressed air from said air valve, and a mechanical link connected to said rotor so that said first tunable capacitor is tuned by movement of said mechanical link.

5,815,048

SWITCHABLE DUPLEX FILTER

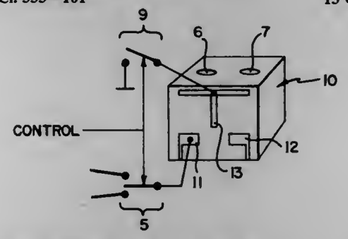
Jouni Ala-Kojola, and Jukka Loukkola, both of Kempele, Finland, assignors to LK-Products Oy, Kempele, Finland

Filed Nov. 22, 1996, Ser. No. 754,873

Claims priority, application Finland, Nov. 23, 1995, 955637

Int. Cl.[6] H01P *5/12;1/202*

U.S. Cl. 333—101 **13 Claims**



1. A radio frequency filter, which comprises:

a first transmission line resonator (6) and a second transmission line resonator (7), arranged to have an electromagnetic coupling therebetween,

a first port (ANT, 12) for conducting a signal between the radio frequency filter and an antenna,

a second port (TX/RX, 11) for conducting a signal between the radio frequency filter and other parts of a radio equipment,

a regulating element (8, 13) having a single strip conductive pattern (13) extending in length substantially between the transmission line resonators (6, 7) for affecting the electromagnetic coupling,

first switching means (9) between the regulating element (8, 13) and a ground potential for changing the potential of the regulating element to connect or to disconnect the single strip conductive pattern (13) to the ground potential or from the ground potential, respectively, wherein the transmission line resonators (6, 7) operate to perform passband functions in every configuration of the first switching means in connecting or disconnecting the single strip conductive pattern (13) to the ground potential or from the ground potential, respectively,

second switching means having a single switch (5) between the second port (TX/RX, 11) and the transmission and reception part of said radio equipment wherein the single switch (5) is arranged so as to switch the second port (TX/RX, 11) alternatively to said transmitter part or reception part, with the single switch (5) operating in synchronization with said first switching means (9).

5,815,049

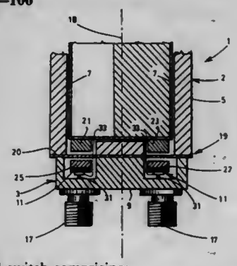
MAGNETIC COUPLING OF A WAVEGUIDE SWITCH TO A COAXIAL SWITCH

Guido G. Cappelli, 46 Browning Dr., Dollard-des-Ormeaux, Quebec, Canada, H9G 2K4

Continuation-in-part of Ser. No. 598,707, Feb. 8, 1996, abandoned. This application Mar. 10, 1997, Ser. No. 814,474

Int. Cl.[6] H01P *1/10*

U.S. Cl. 333—106 **10 Claims**



1. In a dual switch comprising:

a waveguide microwave switch having a waveguide hollow member and a waveguide rotating section rotatably mounted about a rotational axis within said waveguide hollow member at one end thereof;

a coaxial microwave switch comprising a coaxial hollow member adjacent to the one end of the waveguide hollow member, and a coaxial rotating section rotatably mounted within said coaxial hollow member about an axis coaxial with said rotational axis;

said waveguide rotating section and said coaxial rotating section having opposite surfaces facing each other;

coupling means for coupling said waveguide microwave switch to said coaxial microwave switch each switch carrying different signals;

the improvement wherein said coupling means comprises at least one set of cooperating magnets fastened at a given radial distance from said rotational axis of said waveguide rotating section and said coaxial rotating section respectively;

wherein rotation of said waveguide rotating section about said rotational axis will be followed by a corresponding rotation about said rotational axis of said coaxial rotating section.

5,815,050

DIFFERENTIAL DELAY LINE

Mark Brooks, North Mankato; Mark Hamilton Broman, Mankato, and Michael Howleson, Good Thunder, all of Minn., assignors to Thin Film Technology Corp., North Mankato, Minn.

Filed Dec. 27, 1996, Ser. No. 773,434

Int. Cl.[6] H01P *1/18;9/00*

U.S. Cl. 333—161 **14 Claims**

1. Delay line apparatus comprising:

a) a signal layer including first and second signal conductors having a plurality of serpentine windings deposited in displaced parallel registry to one another on one surface of a substrate, wherein the windings extend laterally at a reduced width in a pinched region between adjoining end regions, wherein first and second ground conductors are deposited in strips coextensive with said first and second signal conductors, a plurality of input and output terminals connected to said first and second signal conductors and to opposite surfaces of the substrate, first termination means deposited at a

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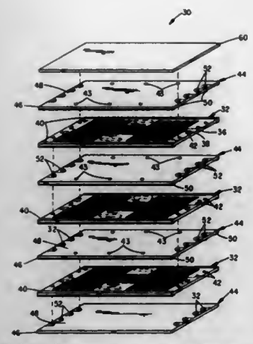


surface of the substrate opposite said pinched region of sand first and second signal conductors and connected to at least one of said first and second ground conductors, a dielectric resin deposited over said first and second signal conductors, and wherein each of said first and second signal conductors exhibit a constant impedance over its length;

b) first and second ground layers respectively mounted above and below said signal layer, wherein each of said first and second ground layers includes a dielectric substrate having a conductive ground plane substantially covering a first surface and including second termination means at a second surface opposite to said first surface and connected to said conductive ground plane, wherein the second termination means of one of said first and second ground layers lies in registry with and contacts said first and second ground conductors, wherein the ground plane of the other of said first and second ground layers contacts the first terminations means, and including third termination means exposed at at least one of the first and second surfaces and electrically isolated from said conductive ground plane and lying in registry and contact with said input and output terminals, whereby said first and second signal conductors are displaced from the ground planes by a single thickness of substrate; and

c) means for coupling electrical signals to said third termination means and a reference ground signal to said first and second ground layers.

5,815,051

DIFFERENTIAL FILTER CIRCUIT AND INTEGRATED CIRCUIT STRUCTURE THEREFOR

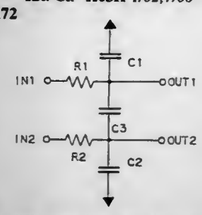
Toshihiko Hamasaki, Yokohama; Hitoshi Terasawa, Tokyo, and Toshio Murota, Kanagawa, all of Japan, assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Sep. 25, 1996, Ser. No. 718,918

Claims priority, application Japan, Sep. 29, 1995, 7-253689

Int. Cl.[6] H03H *1/02;7/06*

U.S. Cl. 333—172 **18 Claims**



1. A first-order differential low pass filter circuit comprising:

a first resistor exclusively connected between a first input terminal and a first output terminal;

a second resistor having the same resistance value as said first resistor and exclusively connected between a second input terminal and a second output terminal;

a first capacitor connected between said first output terminal and a reference potential;

a second capacitor having the same capacitance value as said first capacitor and connected between said second output terminal and said reference potential; and

a third capacitor connected between said first output terminal and said second output terminal.

5,815,052

HIGH-FREQUENCY COMPOSITE COMPONENTS COMPRISING FIRST AND SECOND CIRCUITS CONNECTED IN PARALLEL FOR MULTI-FREQUENCY SYSTEMS

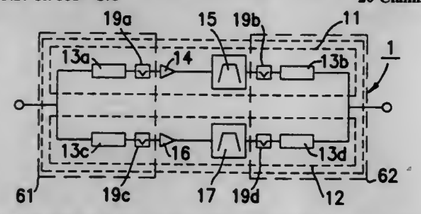
Norio Nakajima, Takatsuki; Mitsuhide Kato, Siga-ken, and Harufumi Mandai, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 30, 1996, Ser. No. 655,413

Claims priority, application Japan, May 31, 1995, 7-134062

Int. Cl.[6] H03H *7/01;* **H04B** *1/18*

U.S. Cl. 333—175 **20 Claims**



9. A high-frequency composite component for use in a multi-frequency system, comprising first and second circuits connected in parallel, the first circuit having substantially infinite input impedance at a first frequency whereby said first frequency is passed by said second circuit, and the second circuit having substantially infinite input impedance at a second frequency whereby said second frequency is passed by said first circuit;

wherein said first circuit includes a first phase shifter and a first trap circuit connected as a load of said first phase shifter, said first phase shifter providing said substantially infinite input impedance at said first frequency, and said first trap circuit providing substantially zero load impedance at said first frequency; and

wherein said first circuit further includes an amplifier and a bandpass filter for said second frequency.

5,815,053

CERAMIC FILTER VIBRATING IN THE THICKNESS SHEAR-SLIDE MODE WITH ELECTRODE SPACINGS IN THE RANGE OF ONE TO THREE SUBSTRATE THICKNESSES

Tomoaki Futakuchi, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 14, 1993, Ser. No. 136,969

Claims priority, application Japan, Oct. 16, 1992, 4-305029

Int. Cl.[6] H03H *9/56*

U.S. Cl. 333—191 **8 Claims**

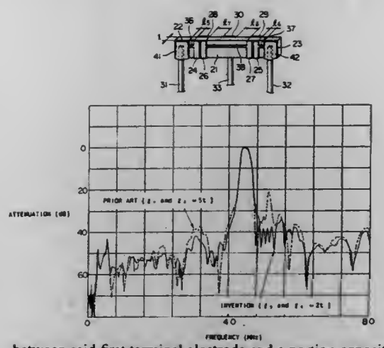
1. An energy trapping type ceramic filter vibrating in a thickness shear-slide mode, said ceramic filter comprising:

an elongated piezoelectric ceramic substrate having a front major surface and a rear major surface;

first and second terminal electrodes formed on end portions of said front major surface of said substrate;

a third terminal electrode formed at a central position on said rear major surface of said substrate;

first and second vibrating electrodes adjacently formed on said front major surface of said substrate in intermediate positions



between said first terminal electrode and a portion opposite to said third terminal electrode;

third and fourth vibrating electrodes adjacently formed on said front major surface of said substrate in intermediate positions between said second terminal electrode and a portion opposite to said third terminal electrode;

a fifth vibrating electrode formed on said rear major surface of said substrate in a position opposite to said first and second vibrating electrodes;

a sixth vibrating electrode formed on said rear major surface of said substrate in a position opposite to said third and fourth vibrating electrodes;

a first extracting electrode formed on said front major surface of said substrate for connecting said first terminal electrode with said first vibrating electrode;

a second extracting electrode formed on said front major surface of said substrate for connecting said second terminal electrode with said fourth vibrating electrode;

a third extracting electrode formed on said front major surface of said substrate for connecting said second and third vibrating electrodes with each other;

a fourth extracting electrode formed on said rear major surface of said substrate for connecting said third terminal electrode with said fifth vibrating electrode; and

a fifth extracting electrode formed on said rear major surface of said substrate for connecting said third terminal electrode with said sixth vibrating electrode; wherein

a distance l_5 between said first terminal electrode and said first vibrating electrode located adjacent to said first terminal electrode is set within a range of one to three times a magnitude of a thickness of said substrate and

a distance l_6 between said second terminal electrode and said fourth vibrating electrode located adjacent to said second terminal electrode is set within a range of one to three times a magnitude of a thickness of said substrate.

5,815,054

SURFACE MICROMACHINED ACOUSTIC WAVE PIEZOELECTRIC CRYSTAL WITH ELECTRODES ON RAISED RIDGES AND IN SPACES THEREBETWEEN

Bruce Vojak, Wheaton; Jiashi Yang, Schaumburg; Jin Huang, Hoffman Estates, and John Mattson, Palatine, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 27, 1997, Ser. No. 863,404

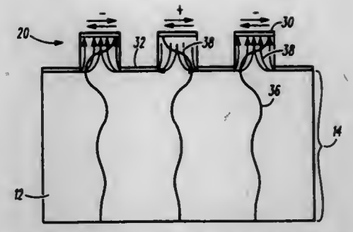
Int. Cl.[6] H03H *9/205;9/56*

U.S. Cl. 333—191 **8 Claims**

1. An acoustic wave piezoelectric device, comprising:

a piezoelectric substrate having a thickness defined by an upper and a lower surface;

a plurality of raised ridges integral with the upper surface of the piezoelectric substrate and having a spacing therebetween, the raised ridges having a base at the upper surface of the substrate and a top defining a height of the ridges;



a plurality of top electrodes disposed on corresponding tops of the raised ridges; and

a plurality of bottom electrodes disposed on the upper surface of the piezoelectric substrate within the spacing between the raised ridges, the top and bottom electrodes being substantially non-opposing,

the top electrodes are alternately connected to a first and a second connection wherein, when the first and second connections are driven by an AC signal, the raised ridges vibrate in a substantially anti-phase mode generating acoustic waves which are directed vertically into the piezoelectric substrate and are substantially canceled within a body of the substrate.

5,815,055

MATCHED FILTER WITH IMPROVED SYNCHRONOUS CHARACTERISTICS, AND RECEPTION DEVICE AND COMMUNICATION SYSTEM USING THE SAME

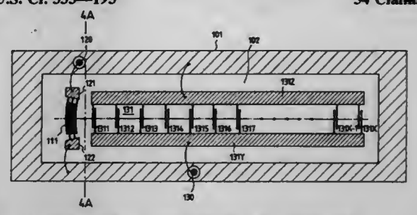
Tadashi Eguchi, Higashi; Akira Torisawa, Machida; Koichi Egara, Setagaya-ku; Akihiro Koyama, Ohta-ku; Takahiro Hachisu, and Akane Yokota, both of Ohta-ku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1996, Ser. No. 681,331

Claims priority, application Japan, Jul. 24, 1995, 7-187190; Jul. 18, 1996, 8-189421

Int. Cl.[6] H03H *9/64;* **H04B** *1/69*

U.S. Cl. 333—193 **54 Claims**



1. A surface acoustic wave matched filter comprising:

an input interdigital transducer (IDT) formed on a substrate having piezoelectric characteristics and adapted to excite surface acoustic waves corresponding to an input code sequence signal;

an output IDT in which electrode fingers are arranged in correspondence with a predetermined code sequence; and

first anti-divergence means for preventing divergence of the surface acoustic waves which are excited by said input IDT and propagate toward said output IDT.

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5,815,056

DIELECTRIC RESONATOR HAVING AN ELONGATED NON-CONDUCTIVE RESONATOR GAPS AND MANUFACTURING METHOD THEREOF

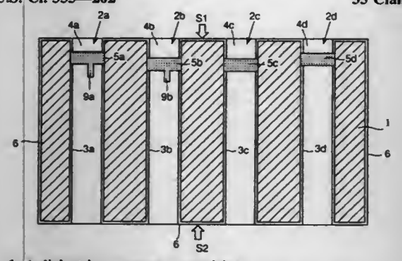
Hitoshi Tada; Hideyuki Kato; Haruo Matsumoto, and Tatsuya Tsujiguchi, all of Ishikawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 19, 1994, Ser. No. 358,348

Claims priority, application Japan, Dec. 21, 1993, 5-322175

Int. Cl.[6] H01P *1/205*

U.S. Cl. 333—202 **35 Claims**



1. A dielectric resonator, comprising:

a dielectric block having a pair of opposing end surfaces;

an outer conductor disposed at least on one of said pair of opposing end surfaces and on side surfaces of said dielectric block extending between said end surfaces;

a plurality of resonator holes piercing through at least one of said pair of end surfaces of said dielectric block and defining an axial direction oriented between said opposing end surfaces;

a plurality of inner conductors on respective peripheral surfaces of corresponding said resonator holes, each inner conductor having an open-circuited end at one end thereof, and the other end thereof connected to said outer conductor to serve as a short-circuited end, and serving as a respective resonator; and

a first non-conducting portion and at least one second nonconducting portion provided on a corresponding peripheral surface of a respective one of said resonator holes, said first and second non-conducting portions respectively being portions of said corresponding peripheral surface having no inner conductor thereon, said respective second non-conducting portion having a generally elongated shape with a prescribed length, and said shape being oriented in said axial direction of said corresponding resonator hole near the open-circuited end of said corresponding inner conductor.

5,815,057

ELECTRONICALLY CONTROLLED SWITCHING DEVICE

Jerzy Hoffman, Las Vegas, Nev., and John L. Wenger, Salisbury, Md., assignors to K & L Microwave Incorporated, Salisbury, Md.

Filed May 17, 1996, Ser. No. 650,105

Int. Cl.[6] H01H *53/00*

U.S. Cl. 335—4 **37 Claims**

1. An electrically-controlled, electromagnetic switching device for controlling the flow of electrical current between a plurality of terminals, said switching device comprising:

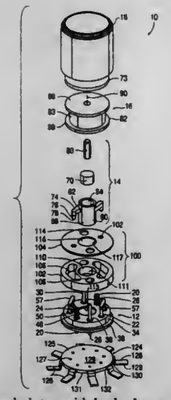
an input terminal;

a first output terminal;

a second output terminal;

a contact element, said contact element movable between a first position which electrically couples the first output terminal and the input terminal, and a second position which electrically couples the second output terminal and the input terminal;

an actuator, said actuator having a body including a permanent magnet, and a ferromagnetic tip member movable with and



structurally coupled to said body by a magnetic attraction force between said tip member and said permanent magnet, said actuator structurally coupled to said movable contact element and movable between first and second positions, said movable contact element being in its first position when the actuator is in its first position and said movable contact element being in its second position when the actuator is in its second position;

a magnetic field generator having a hollow centrally-located sleeve and a coil wound around the sleeve in a predetermined direction, said hollow sleeve having a longitudinal center axis defined therein, said tip member of said actuator positioned within the hollow sleeve of the magnetic field generator for movement along said longitudinal center axis, wherein application of electrical current to said coil creates a magnetic field forcing the tip member in a predetermined direction, which moves the actuator, with its tip member, from one of its said first and second positions to the other of its said first and second positions.

5,815,058

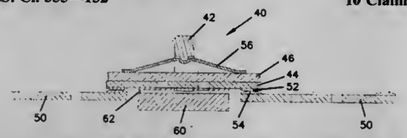
CONTACT ENHANCEMENT APPARATUS FOR AN ELECTRIC SWITCH

Daniel Gizaw, Blaine, Minn., assignor to Onan Corporation, Minneapolis, Minn.

Filed Apr. 2, 1997, Ser. No. 832,074

Int. Cl.[6] H01H *67/02*

U.S. Cl. 335—132 **10 Claims**



1. A contact enhancement apparatus for an electric switch, comprising:

a stationary contact arm having at least one electrical contact;

a moveable contact arm having at least one electrical contact, the electrical contacts of the moveable and stationary contact arms being electrically connectable to each other;

a crossbar carrying the moveable contact arm and lifting and lowering the moveable contact arm such that the electrical contacts of the stationary and moveable contact arms are connected and disconnected to and from each other by the crossbar;

a spring being disposed between the moveable contact and the crossbar, the moveable contact arm being spring-biased toward the stationary contact arm by the spring when the

electrical contacts of the moveable and stationary contact arms are connected to each other;

an electro-magnetic bar being disposed in sandwich between the crossbar and the moveable contact arm, such that the electro-magnetic bar is lifted and lowered along with the crossbar and the moveable contact arm; and

a U-shaped electro-magnetic bar being horizontally spaced apart from the stationary contact arm, the moveable contact arm being at least partially insertable inside the U-shaped electro-magnetic bar when the electrical contacts of the moveable and stationary contact arms are connected to each other, an air gap being formed between the electro-magnetic bar and the U-shaped electro-magnetic bar.

5,815,059

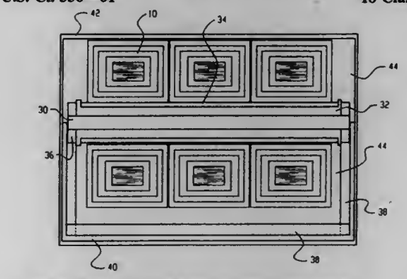
COAXIAL ISOLATION MOUNTING OF A TOROIDAL TRANSFORMER

George Edward Dailey, McLean; Thomas E. Hatton, Manassas; Rene D. Mock, Mine Run, and Frederick Oswald Volles, Manassas, all of Va., assignors to Lockheed Martin Corporation, Bethesda, Md.

Continuation of Ser. No. 150,573, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 691,937, Apr. 26, 1991, abandoned. This application Feb. 22, 1996, Ser. No. 605,832

Int. Cl.[6] H01F *27/06;27/08;27/30*

U.S. Cl. 336—61 **18 Claims**



1. A low noise power transformer unit comprising:

a mounting case;

a cradle positioned within said mounting case and supported by said mounting case, said cradle having a first support arm on one side thereof and a second support arm on another side thereof;

a layer of vibration isolating material interposed between said cradle and said mounting case to provide a first level of vibration isolation within said power transformer unit;

a longitudinal support rod positioned within said mounting case and including first and second opposing ends, the first supporting arm of said cradle supporting said first opposing end of said support rod within said mounting case and the second supporting arm of said cradle supporting the second opposing end of said support rod within said mounting case so that the weight of said support rod is carried by said first and second supporting arms;

at least one toroidal-shaped transformer coaxially positioned about said support rod within said mounting case;

a second layer of vibration isolating material interposed between said support rod and said toroidal-shaped transformer to provide a second level of vibration isolation within said power transformer unit; and

a cooling sleeve positioned within said mounting case and substantially about both said second layer of vibration isolating material and said support rod and between said second layer of vibration isolating material and the inner surface of said transformer.

5,815,060

INDUCTANCE ELEMENT

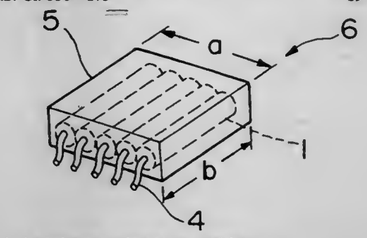
Norio Matsumoto, Sodegaura; Takashi Matsuoka, Tokyo, and Takehiko Omi, Sodegaura, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 25, 1994, Ser. No. 348,895

Claims priority, application Japan, Nov. 25, 1993, 5-295700; Nov. 24, 1994, 6-313980

Int. Cl.[6] H01H *7/10*

U.S. Cl. 336—175 **19 Claims**



1. An inductance element, comprising:

a magnetic core formed by winding a magnetic alloy thin strip, which is made of Fe-based amorphous alloy, said magnetic core having a hollow portion in the vicinity of a center; and

a lead line disposed to pass through the hollow portion of said magnetic core;

wherein a relative permeability μ of said magnetic core is in the range of 100 to 10,000.

5,815,061

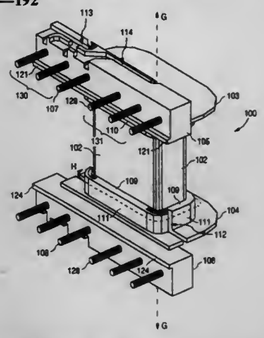
LOW COST AND MANUFACTURABLE TRANSFORMER MEETING SAFETY REQUIREMENTS

Francis Man Shuen Ho, Sheung Shui, Hong Kong, assignor to Computer Products, Inc., Boca Raton, Fla.

Filed Jan. 19, 1996, Ser. No. 588,950

Int. Cl.[6] H01F *27/29;27/30*

U.S. Cl. 336—192 **3 Claims**



1. A transformer comprising:

a bobbin having a primary winding surface and a margining ledge integrally formed with the primary winding surface, the margining ledge having an elongated outer surface which extends lengthwise in a direction substantially parallel to said primary winding surface, a groove extending through a portion of the margining ledge from the outer surface of the margining ledge inward toward the primary winding surface and then extending through another portion of the margining ledge in a direction substantially parallel to the primary winding surface and substantially parallel to the outer surface of the margining ledge, wherein the primary winding surface is disposed about an axis such that the axis does not pass through the primary winding surface, the bobbin having a first

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face plate and a second face plate, the first face plate having a surface which extends in a first plane perpendicular to the axis, the second face plate having a surface which extends in a second plane perpendicular to the axis, the primary winding surface being disposed between the first and second planes, the transformer further comprising:

a primary winding wire extending through the first plane and through the margining ledge in the groove in a direction substantially parallel to the axis, and extending around the axis numerous times over the primary winding surface but not extending over the outer surface of the margining ledge, a portion of the margining ledge being disposed between the wire where the wire passes through the margining ledge and the portion of the outer surface of the margining ledge which is closest to the portion of the wire;

a layer of insulation extending from the first face plate over the margining ledge and to the second face plate such that the primary winding wire which extends around the axis is disposed between the layer of insulation and the primary winding surface;

a collar shaped margining bib which fits over the margining ledge such that a portion of the layer of insulation is sandwiched between the bib and the outer surface of the margining ledge; and

a secondary winding wire extending around the axis over the layer of insulation, the bib margining the second winding wire which extends around the axis to the same extent in the axial dimension as the margining ledge margins the first winding wire which extends around the axis.

5,815,062

MAGNETIC CORE

Norikazu Koyuhara, Tottori; Youichi Yamamoto, Yazu-gun, and Toshibiko Tanaka, Iwami-gun, all of Japan, assignors to Hitachi Metal, Ltd., Tokyo, and Hitachi Ferrite Electronics, Ltd., Tottori, both of Japan

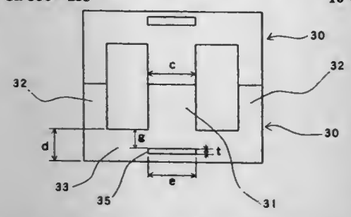
PCT No. PCT/JP96/01807, § 371 Date Feb. 28, 1997, § 102(e) Date Feb. 28, 1997, PCT Pub. No. WO97/02293, PCT Pub. Date Jan. 23, 1997

PCT Filed Jun. 28, 1996, Ser. No. 809,205

Claims priority, application Japan, Jun. 30, 1995, 7-165075

Int. Cl.[6] H01F *17/06;27/24*

U.S. Cl. 336—233 **10 Claims**



1. A magnetic core comprising at least one magnetic core piece comprising a first leg portion around which a wire is wound, a second leg portion for circulating a magnetic flux generated in said first leg portion, and a web portion connecting said first leg portion and said second leg portion, said web portion being provided with a magnetic gap in a root extension area extending from the root of said first leg portion, and at least a portion of said magnetic gap being positioned outside the center line of said root extension area.

5,815,063

POSITIVE TEMPERATURE COEFFICIENT THERMISTOR AND FABRICATION METHOD THEREOF

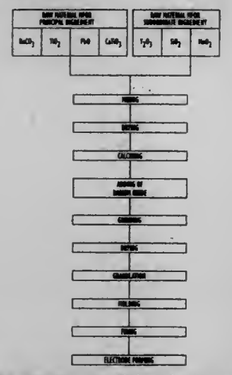
Yasushi Goto, Ikeda; Eiichi Koga, Neyagawa, and Takuoki Hata, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 238,899, May 6, 1994. This application Oct. 10, 1996, Ser. No. 729,071

Claims priority, application Japan, Sep. 6, 1993, 5-221092

Int. Cl.[6] H01C *7/10*

U.S. Cl. 338—22 R **6 Claims**



1. A positive temperature coefficient fired ceramic thermistor having, a principal ingredient comprising

barium titanate, lead titanate and calcium titanate, and

a subordinate ingredient comprising silicon dioxide, manganese dioxide, about 0.1 to about 2.0 mol % of aluminum compound and at least one oxide selected from the group consisting of yttrium oxide, lanthanum oxide, samarium oxide, dysprosium oxide, cerium oxide and gallium oxide,

said positive temperature coefficient fired ceramic thermistor being manufactured by a method comprising the steps of:

a. mixing raw material powder corresponding to the principal ingredient comprising a titanium compound, a barium compound, a lead compound and a calcium compound with raw material powder corresponding to the subordinate ingredient comprising a silicon compound, a manganese compound, an aluminum compound and at least one element selected from the group consisting of yttrium, lanthanum, samarium, dysprosium, cerium and gallium;

b. calcining the raw material powder mixed in said step (a);

c. grinding the powder calcined in said step (b) into pieces;

d. molding the powder ground in said step (c) into shapes; and

e. firing the shapes molded in said step (d);

wherein the calcium compound in said step (a) comprises calcium titanate powder,

wherein an average particle diameter of the calcium titanate powder in said step (a) is smaller than a mean particle diameter of the remaining components of the raw material powders used in said step (a),

wherein an average particle diameter of said remaining components of said raw material powders used in said step (a) is 1.3 μm or less, and

wherein said positive temperature coefficient fired ceramic thermistor resists deterioration in a reducing atmosphere and shows smaller changes in room temperature resistance, resistance-temperature coefficient and resistance change width over voltage, resulting from employing in step (a) said principal and subordinate ingredients with said average and mean particle diameters of said calcium titanate powder and said remaining component powders and then employing said steps (b)–(e), as compared to a thermistor with principal and subordinate ingredients made by steps (a)–(e) but not having said average and mean particle diameters of said calcium titanate powder and said remaining component powders employed as a raw material prior to calcining.

5,815,064

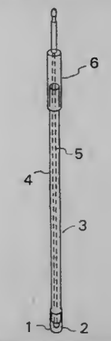
SNOW TEMPERATURE AND DEPTH PROBE

Jonathan Alfred Holmgren, and Matthew Sturm, both of Fairbanks, Ak., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1997, Ser. No. 794,922

Int. Cl.[6] H01C *3/04*

U.S. Cl. 338—28 **10 Claims**



1. A snow temperature probe for determining the temperature in snow at various depths below the surface of the snow, down to the interface between the snow and the ground, by means of a temperature indicating instrument, comprising

(a) an elongated hollow tube made of carbon fiber having affixed to one end thereof, a hollow metal cap forming a housing;

(b) temperature-sensing means electrically connected to insulated wires, the temperature-sensing element being disposed in the hollow metal cap and the wires passing through the hollow tube to the distal end thereof; and

(c) means for electrically connecting the wires at the distal end of the hollow tube to input terminals of the temperature indicating instrument;

whereby the temperature of the snow at any level can be accurately measured by inserting the probe into the snow.

5,815,065

CHIP RESISTOR DEVICE AND METHOD OF MAKING THE SAME

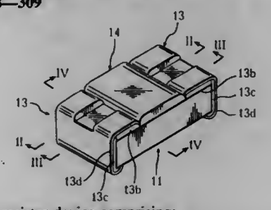
Toshihiro Hanamura, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto-fu, Japan

Filed Jan. 6, 1997, Ser. No. 779,108

Claims priority, application Japan, Jan. 10, 1996, 8-002152

Int. Cl.[6] H01C *1/012*

U.S. Cl. 338—309 **7 Claims**



1. A chip resistor device comprising;

an insulating chip substrate having a top surface and an opposite pair of end faces;

a resistor film formed on the top surface of the chip substrate;

a protective coating formed on the top surface of the chip substrate for covering the resistor film, and

a pair of terminal electrodes provided at both ends of the chip substrate, each of the terminal electrodes including a main top electrode layer formed on the top surface of the chip substrate in electrical conduction with the resistor film, an auxiliary top electrode layer formed on the main top electrode layer, a side electrode layer formed on a corresponding end face of the chip substrate, and a plated metal electrode layer formed on the auxiliary top electrode layer and the side electrode layer;

wherein the auxiliary top electrode layer is formed with a cutout into which the plated metal electrode layer extends for coming into direct contact with the main top electrode layer.

5,815,066

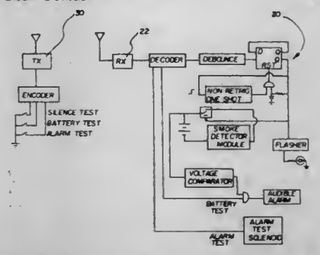
FIRE ALARM SAFETY SILENCING SYSTEM

Thomas F. Pumilia, 305 Hurley Ave. #25B, Kingston, N.Y. 12401

Filed Apr. 29, 1997, Ser. No. 846,529

Int. Cl.[6] G08B *1/00*

U.S. Cl. 340—309.15 **10 Claims**



1. A fire alarm system which allows a user to remotely deactivate said fire alarm system for a finite period of time whereafter the fire alarm system reactivates itself, comprising:

a fire alarm having a receiver within which detects a signal;

a transmitter which transmits said signal to said receiver within said fire alarm which carries a deactivation code which deactivates said fire alarm for said finite period of time and upon expiration of said finite period of time said fire alarm reactivates itself;

said transmitter comprising a first switch whereupon being depressed said transmitter transmits said signal carrying said deactivation code;

a second switch whereupon being depressed said transmitter transmits said signal carrying a battery test code;

a third switch whereupon being depressed said transmitter transmits said signal carrying said battery test code; and

an LED which emits light when said fire alarm is selectively deactivated during said finite period of time.

5,815,067

SINGLE CONTROL WIRE DEVICE FOR HID DIMMING

David W. Knoble, Tupelo; Khosrow Jamasbi, Belden; Robert D. Munson, Tupelo, all of Miss., and James V. Olson, Indianapolis, Ind., assignors to Thomas Lighting, Tupelo, Miss.

Filed May 19, 1997, Ser. No. 858,508

Int. Cl.[6] H04M *11/04*

U.S. Cl. 340—310.01 **10 Claims**

1. A high intensity discharge light dimming apparatus for a high intensity discharge light system, comprising:

a multi-phase power supply system;

a transmitter connected between two phases of said multi-phase power supply system or between one phase of said multi-phase power supply system and neutral, said transmitter responding to a predetermined condition by generating a control signal;

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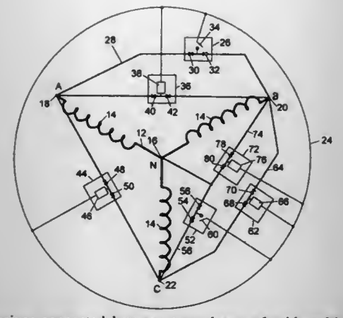


a receiver connected between two phases of said multi-phase power supply system or between one phase of said multi-phase power supply system and neutral, said receiver including a switch connected to effect a dimming of a light of said high intensity discharge light system upon receipt of said control signal; and

a single control wire connected between said transmitter and said receiver to carry a control signal upon occurrence of said predetermined condition.

5,815,068

GUIDING LIGHT SYSTEM AND LIGHTING STRIP

Jan Erik Vadseth, P.O. Box 10 Tele, Tønsberg, Norway

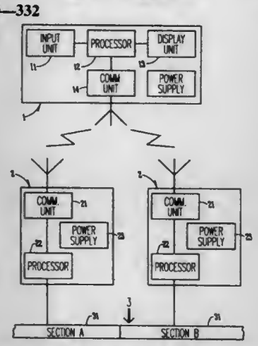
PCT No. PCT/NO94/00199, § 371 Date Jun. 5, 1996, § 102(e) Date Jun. 5, 1996, PCT Pub. No. WO95/16249, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 8, 1994, Ser. No. 652,435

Claims priority, application Norway, Dec. 8, 1993, 934463

Int. Cl.[6] G08B *5/00*

U.S. Cl. 340—332 **25 Claims**



1. A guiding light system comprising controllable light sources which can be used as optical means for influencing persons to follow an assigned route of movement to one selected of a plurality of target areas, wherein:

said light sources are disposed along alternative routes of movement, and

the system further comprising operation control means for turning light sources on and off in such a way that light sources located along the assigned route, indicate movement in the direction of the target area selected, in the form of traveling light,

and wherein a centrally located part (1) of said operation control means (1,2) comprises:

display means (13) to show one or more general views selected from a collection of such general views of alternative routes of movement along which said light sources (35, 36) are located,

input means (11) to designate manually, at any time, one or more of the routes of movement shown and, at any time, establish new routes of movement, or amend present routes of movement to be shown in said general view presented by the display means (13), and

processing and communication means (12, 14, 21, 22) being provided to activate upon command entered through said input means (11), said traveling light from light sources (35, 36) which correspond to the respective designated route, or routes, of movement.

5,815,069

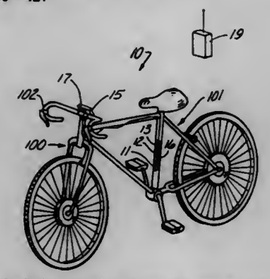
BICYCLE THEFT PREVENTION SYSTEM

Douglas R. Horton, Merriam, Kans., assignor to P B Deals, Inc., Kans.

Filed Sep. 19, 1997, Ser. No. 933,890

Int. Cl.[6] B60R *25/10*

U.S. Cl. 340—427 **9 Claims**



1. A bicycle theft prevention system for use on a bicycle wherein the theft prevention system comprises:

a first housing member dimensioned to be received within the hollow tubular framework of the bicycle and containing an alarm unit and a tracking unit;

a second housing member operatively associated with the first housing member and disposed on the exterior of the framework of the bicycle and containing first means to assist in the apprehension of a bicycle thief.

5,815,070

DRIVING STATE-MONITORING APPARATUS FOR AUTOMOTIVE VEHICLES

Kenji Yoshikawa, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1996, Ser. No. 690,796

Claims priority, application Japan, Aug. 1, 1995, 7-214001

Int. Cl.[6] G08B *21/00*

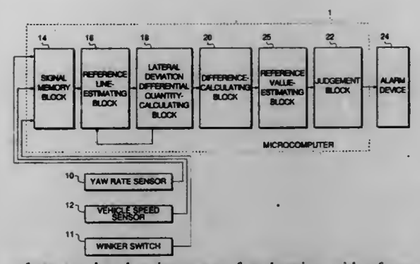
U.S. Cl. 340—439 **16 Claims**

1. A driving state-monitoring apparatus for an automotive vehicle, for monitoring a driving state of a driver of said automotive vehicle, comprising:

driving state parameter-calculating means for calculating a driving state parameter indicative of said driving state of said driver based on at least one of behavior of said automotive vehicle, a driving operation of said driver, and a condition of said driver;

comparison means for comparing said driving state parameter with a reference value;

determining means for determining whether or not said driving state of said driver is normal based on a result of said comparison by said comparison means; and



reference value-changing means for changing said reference value based on said driving state parameter calculated by said driving state parameter-calculating means, in such a direction that it becomes less possible to determine that said driving state of said driver is normal, wherein said reference value-changing means progressively changes said reference value based on said driving state parameter calculated by said driving state parameter calculating means in such a direction that it becomes less possible to determine that said driving state of said driver is normal, after said automotive vehicle is started.

5,815,071

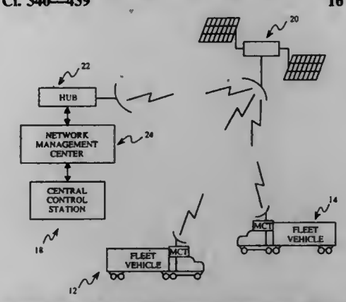
METHOD AND APPARATUS FOR MONITORING PARAMETERS OF VEHICLE ELECTRONIC CONTROL UNITS

Thomas F. Doyle, San Diego, Calif., assignor to QUALCOMM Incorporated, San Diego, Calif.

Continuation of Ser. No. 398,234, Mar. 3, 1995, abandoned. This application Dec. 12, 1996, Ser. No. 766,217

Int. Cl.[6] B60Q *1/00;* **G08C** *19/00*

U.S. Cl. 340—439 **16 Claims**



1. Method for monitoring electronic control unit (ECU) parameters to detect tampering of expected ECU parameters in a vehicle which includes an ECU, said ECU being connected to a data link within said vehicle, said ECU having a parameter stored therein for regulating a corresponding operational function of said vehicle, said vehicle being in communication with a remote base station, the method comprising the steps of:

storing a list of initial ECU preset expected operational function regulating parameters within a memory unit within said vehicle, separate from said ECU;

retrieving a current ECU parameter from said ECU within said vehicle at predetermined intervals;

comparing said current ECU parameter to said initial ECU preset expected parameters and detecting disagreement therebetween; and

transmitting, to said remote base station, said current ECU parameter which is in disagreement with a corresponding initial ECU preset expected parameter.

5,815,072

VEHICLE DISPLAY DEVICE

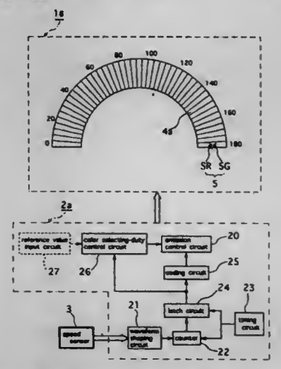
Osamu Yamanaka, Aichi-Ken; Makoto Tamaki, Kani; Takemasa Yasukawa, Ichinomiya; Hiroshi Sugihara, Ogakai; Kazushi Noda, Ichinomiya; Yoshio Sano, Gifu-ken, and Tetsuo Tanabe, Ogaki, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan

Filed Jul. 9, 1997, Ser. No. 890,304

Claims priority, application Japan, Jul. 10, 1996, 8-180774; Jul. 10, 1996, 8-180775

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 340—461 **19 Claims**



1. A vehicle display device comprising:

an indicator displaying a variable concerning a vehicle state;

plural LEDs provided on the indicator and lighting the indicator by two or more colors; and

indicator control means for controlling light emission of the LEDs so as to change an emitted light color of the indicator in accordance with a change of the variable around a color changing reference value corresponding to a fixed value of the variable,

wherein the indicator control means gradually changes the emitted light color of the LED from an emitted light color before a color change to an emitted light color after the color change via a mixed color thereof.

5,815,073

EMERGENCY LIGHT AUTOMATIC LIGHTING SYSTEM FOR VEHICLES

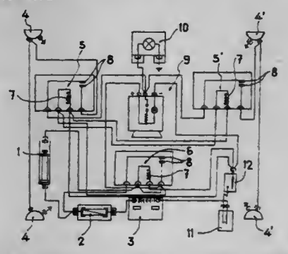
Francisco Sanchez Gomez, Virgen de Africa 7., 28027 Madrid, and Gonzalo Diosdado Antolin, Garcia Salazar 5., 28017 Madrid, both of Spain

Filed Jan. 24, 1997, Ser. No. 787,299

Claims priority, application Spain, Jan. 25, 1996, 9600178

Int. Cl.[6] G60Q *1/52*

U.S. Cl. 340—471 **5 Claims**



1. For use in a vehicle, an automatic emergency lighting system comprising:

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an emergency lamp;

means for developing a signal in response to deceleration of the vehicle having a magnitude above a predetermined level;

a high sensitivity switch having a first inductive coil in communication with the signal developing means and two contacts associated with the first inductive coil, the contacts being adapted to close an energization circuit in response to energization of the first inductive coil by the signal from the signal developing means;

an intermittent signal generator for selectively energizing the emergency lamp of the vehicle; and,

a remote-controlled switch having a second inductive coil in communication with the contacts of the high sensitivity switch and two contacts associated with the second inductive coil, the contacts of the remote-controlled switch being located to couple the intermittent signal generator to the emergency lamp in response to energization of the second inductive coil;

wherein when the contacts of the high sensitivity switch close the energization circuit, the second inductive coil is energized thereby causing the contacts of the remote control switch to couple the intermittent signal generator to the emergency lamp.

5,815,074

SIGNAL TRANSMISSION APPARATUS

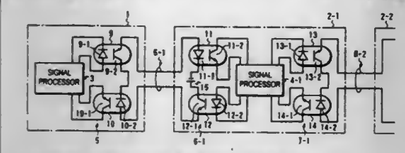
Shinichi Sasagawa; Shin Kinouchi; Seishi Namioka, and Nobuyuki Ichimiya, all of Miyagi-ken, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1996, Ser. No. 626,788

Claims priority, application Japan, Apr. 26, 1995, 7-102412

Int. Cl.[6] G08B *26/00*

U.S. Cl. 340—505 **8 Claims**



1. A signal transmission apparatus comprising:

a main unit having a first signal transmission terminal including first and second photocouplers;

a sub unit having a second signal transmission terminal and a third signal transmission terminal, each of the second signal transmission terminal and the third signal transmission terminal including first and second photocouplers; and

a plurality of loop connection lines including a first loop connection line linking the first signal transmission terminal of said main unit and said second transmission terminal of said sub unit, and a second loop connection line connected to said third signal transmission terminal of said sub unit;

wherein said main unit further includes control means, signal generating means for generating and sending a first current signal to said sub unit in response to control signals from said control means, and signal processing means for processing a second current signal received from said sub unit, and

wherein said sub unit further includes control means, in a destination signal determination means for determining a destination of said first current signal supplied to said second signal transmission terminal, and signal transfer means for capturing said first current signal if, based on a result of determination made by said destination signal determination means, said first current signal is addressed to said sub unit, for transferring said first current signal to said third signal transmission terminal if said first current signal is not addressed to said sub unit, and for transferring said second current signal supplied to said third signal transmission terminal from said second loop connection line to said first signal transmission terminal through said second signal transmission terminal and said first loop connection line.

5,815,075

FIRE DECTOR INCLUDING A NON-VOLATILE MEMORY

Jacques Lewiner, 7 avenue de Suresnes-92210, Saint-Cloud, and Eugeniusz Smycz, 4 rue du Val Fleury-91240, St-Michel sur Orge, both of France

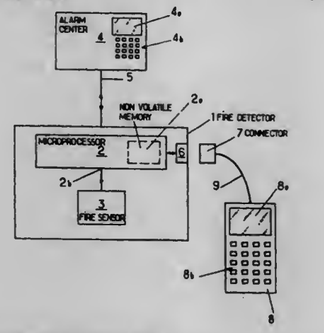
PCT No. PCT/FR95/01011, § 371 Date Jun. 5, 1997, § 102(e) Date Jun. 5, 1997, PCT Pub. No. WO96/04623, PCT Pub. Date Feb. 15, 1996

PCT Filed Jul. 27, 1995, Ser. No. 776,424

Claims priority, application France, Jul. 29, 1994, 94 09476

Int. Cl.[6] G08B *29/00*

U.S. Cl. 340—506 **7 Claims**



1. A fire detector (1) comprising:

a CPU (2) including a non-volatile memory (2*a*) in which a code is recorded representative of at least one characteristic element specific to said fire detector; and

a fire sensor (3) that measures a physical magnitude whose variation serves to detect the existence of a fire in the vicinity of the fire detector, said fire sensor delivering an analog electrical signal (i) referred to as a "measurement" signal to the CPU (2), the value of the measurement signal being representative of the physical magnitude measured by the fire sensor, the above-mentioned characteristic element including a normal value iO for the measurement signal in the absence of a fire;

the detector being characterized in that:

the fire detector further includes interface means (5, 6) giving access to the contents of the non-volatile memory (2*a*) without dismantling the fire detector;

the non-volatile memory (2*a*) further includes dates on which maintenance operations of said fire detector have been performed; and

the CPU (2) is programmed to compare the measurement signal (i) with the normal value iO of the measurement signal on each occasion that it receives an instruction from the interface means (5, 6) to record a maintenance date, and to refuse to record it whenever the measurement signal (i) does not lie within the range iO−ΔI to iO+Δ2, where Δ1 and Δ2 are predetermined values.

5,815,076

PULSED-SIGNAL MAGNETOMECHANICAL ELECTRONIC ARTICLE SURVEILLANCE SYSTEM WITH IMPROVED DAMPING OF TRANSMITTING ANTENNA

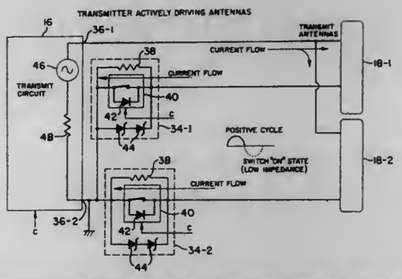
Richard L. Herring, Coconut Creek, Fla., assignor to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Jan. 16, 1996, Ser. No. 585,498

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—572 **21 Claims**

1. A signal transmission apparatus for use with a pulsed-signal magnetomechanical electronic article surveillance system, comprising:



signal generating means for selectively generating an alternating interrogation signal;

transmitting antenna means connected to said signal generating means for receiving said alternating interrogation signal and radiating said alternating interrogation signal into an interrogation zone; and

switchable damping means connected to said antenna means and including an impedance element connected in series with said antenna means and switching means connected across said impedance element for selectively short-circuiting said impedance element, said switching means being maintained in a position for short-circuiting said impedance element when said signal generating means is generating said alternating interrogation signal.

5,815,077

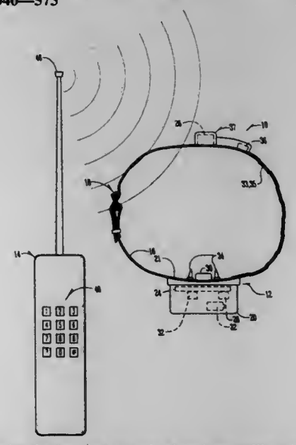
ELECTRONIC COLLAR FOR LOCATING AND TRAINING ANIMALS

Erik P. Christiansen, West Des Moines, Iowa, assignor to B.E.R.T.S. Inc., West Des Moines, Iowa

Filed Nov. 20, 1996, Ser. No. 754,280

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—573 **22 Claims**



1. A device for locating an animal and controlling the animal's behavior, comprising:

a programmable hand held transmitter for selectively broadcasting distinct radio signals; wherein said hand-held transmitter further comprises a radio receiver, and is capable of two-way voice communication with a second similar hand-held transmitter;

a multi-function electronic collar assembly carried by a strap securable to the animal, the collar assembly having a radio signal receiver, a microprocessor, a sounder, a sound sensor and a motion sensor, and an electroshock stimulator thereon;

the microprocessor being connected to the receiver of said collar assembly and having an electrically programmable electronically erasable memory for being programmed by the transmitter;

the sounder being operatively connected to the microprocessor for generating sounds audible to the animal in response to a signal from the microprocessor, at least some of the sounds being humanly audible and thereby indicative of the location of the animal, at least some of the sounds being pleasing to the animal;

the sound sensor being electrically connected to the microprocessor for indicating to the microprocessor when the animal emits undesirable sounds;

the electroshock stimulator being operatively connected to the microprocessor for applying electroshock stimulus to the animal when the animal exhibits undesirable behavior including when the animal emits said undesirable sounds;

the motion sensor being connected to the microprocessor for indicating to the microprocessor when the animal moves;

whereby the transmitter can selectively broadcast one of the distinct radio signals to the microprocessor through the receiver of said collar assembly to respectively place the electronic collar assembly in any one of a plurality of modes including a locating mode and a behavior controlling mode.

5,815,078

LOUVER DRIVING DEVICE FOR AN AIR CONDITIONER AND METHOD OF CONTROLLING THE LOUVER DRIVING DEVICE

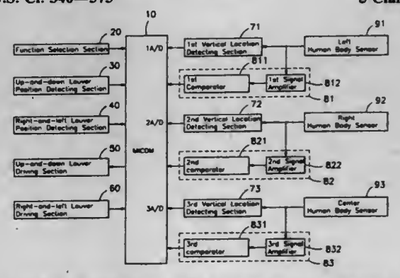
Joong-Ki Mun, Seoul, and Nam-Sick Kim, Yongin, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 18, 1997, Ser. No. 820,770

Claims priority, application Rep. of Korea, Aug. 2, 1996, 1996-32394

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—573 **8 Claims**



1. In an air-conditioner with a main body for intaking and heat-exchanging the indoor air of a room and for discharging the heat-exchanged air into the room, displaceable louvers for varying the discharge direction of the heat-exchanged air in up-and-down/right-and-left/directions, and a louver control mechanism comprising:

human body sensors for detecting the presence of human bodies in respective horizontally adjacent zones of a room, and emitting respective output signals when human bodies are detected;

amplification means connected to each of the human body sensors for amplifying an output signal from a respective human body sensor at first and second amplification factors, to produce from the output signal first and second amplified signals, respectively, the second amplification factor being smaller than the first amplification factor, whereby the first amplified signal has a greater amplification than the second amplified signal;

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location determining means for receiving the first amplified signal and comparing the amplitude thereof with a reference value for determining therefrom a location of a human body in a respective zone, and emitting a corresponding human body location signal;

distance determining means for receiving the second amplified signal for determining from an amplitude and inclination thereof, a distance from the air conditioner to a human body in the respective zone, and emitting a corresponding human body distance signal;

a louver driving means connected to the louver for displacing the louvers to vary the discharge direction of heat-exchanged air; and

means for receiving the human body location signal and the human body distance signal and for generating on the basis thereof a control signal and supplying the control signal to the louver driving means for directing the heat-exchanged air toward the detected human body.

5,815,079

DEVICE FOR ESTABLISHING AND/OR MONITORING A PREDETERMINED FILLING LEVEL IN A CONTAINER

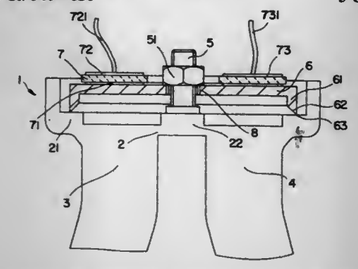
Igor Getman, and Sergej Lopatin, both of Lörrach, Germany, assignors to Endress + Hauser GmbH + Co., Maulfurg, Germany

Filed May 1, 1996, Ser. No. 641,560

Claims priority, application Germany, Jun. 28, 1995, 195 23 461.8

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—620 **5 Claims**



1. A device for establishing and/or monitoring a predetermined filling level in a container, which device comprises:

a housing (1),

two oscillating rods (3, 4) projecting into the container,

a first diaphragm (2) which is fixedly clamped, at its border, into the housing (1) and on which the oscillating rods (3,4) are fastened at a distance apart from one another,

a second diaphragm (6, 6') which is arranged parallel to the first diaphragm (2) in the interior of the housing (1),

fastening means which are arranged on the border and in the center of the second diaphragm (6, 6') and via which the second diaphragm (6, 6') is coupled directly in a mechanical manner to the first diaphragm (2),

a single piezoelectric element (7, 7') which is arranged on the second diaphragm (6, 6'), is in the form of a disk or annular disk, and is intended for inducing bending oscillations in the second diaphragm (6, 6') and for receiving and converting the oscillations thereof into an electric output signal,

the oscillations of the second diaphragm (6, 6') being transmitted directly, via the fastening means, to the first diaphragm (2) and from the latter to the oscillating rods (3, 4), such that the oscillating rods (3, 4) effect oppositely oriented oscillations transversely with respect to their longitudinal axis.

5,815,080

COMMUNICATION APPARATUS

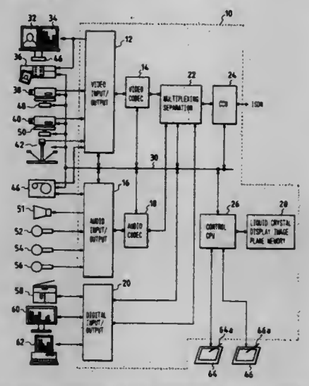
Tomishige Taguchi, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 145,233, Nov. 3, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 601,820

Claims priority, application Japan, Nov. 6, 1992, 4-296758

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—635 **33 Claims**



20. An image communication apparatus for executing an image communication of an image with a partner communication apparatus, comprising:

receiving means for receiving information indicating a controllable function of an image input device connected to the partner communication apparatus, the information being different from the image;

transmitting means for transmitting a control signal for use in controlling the image input device through the partner communication apparatus; and

output means for outputting the information to display it on a display unit.

5,815,081

RADIO PAGING RECEIVER CAPABLE OF PROVIDING A LARGE NUMBER OF ANNOUNCING MODES

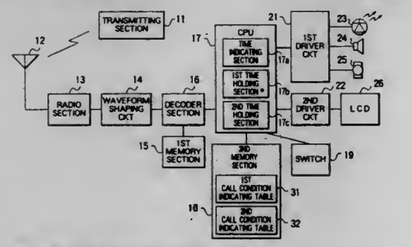
Teruyuki Motohashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1996, Ser. No. 668,147

Claims priority, application Japan, Jun. 21, 1995, 7-153735

Int. Cl.[6] H04Q *7/18*

U.S. Cl. 340—825.44 **4 Claims**



1. A radio paging receiver comprising:

announcing means for carrying out an announcement in response to said radio paging receiver receiving a call signal having one of a plurality of call condition indicating codes;

a plurality of call condition indicating tables, each having a plurality of announcing modes corresponding to said plurality of call condition indicating codes such that one of said plurality of call condition indicating codes may correspond to more than one announcing mode;

table selecting means connected to said plurality of call condition indicating tables for selecting one of said plurality of call condition indicating tables; and

announcement actuating means connected to said announcing means and said table selecting means for actuating said announcing means according to one of said plurality of announcing modes corresponding to said received condition indicating code of said selected call condition indicating table.

5,815,082

LOCAL COMMUNICATION BUS SYSTEM AND APPARATUSES FOR USE IN SUCH A SYSTEM

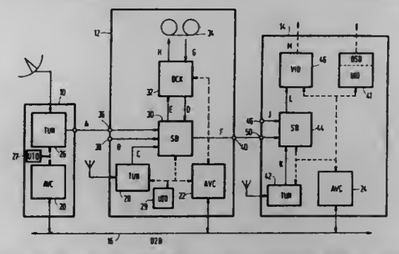
Harm J. Welmer, Sutton, England, assignor to DB2 Systems Company Limited, Surrey RH1 1DL, England

Filed Mar. 18, 1992, Ser. No. 853,373

Claims priority, application United Kingdom, Mar. 22, 1991, 9106113.5; Jun. 26, 1991, 9113793.5

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.07 **29 Claims**



1. A local communication bus system comprising a serial control bus coupled to a plurality of devices, each device comprising a control subdevice and a further subdevice, each device, control subdevice and further subdevice being addressable using said serial control bus, wherein said control subdevice comprises means for generating a first status request message addressed to said further subdevice, and wherein said further subdevice comprises:

a) means responsive to said first status request message for generating a first further subdevice status message to said control subdevice; and

b) means responsive to a change in status in said further subdevice for generating an updated further subdevice status message to said control subdevice without receiving an additional status request message from said control subdevice, if and only if said further subdevice has previously received said first status request message.

5,815,083

PROCESS FOR ENTRY OF A CONFIDENTIAL PIECE OF INFORMATION AND ASSOCIATED TERMINAL

Jacques Patarin, Viroflay, and Michel Ugon, Maurepas, both of France, assignors to Bull CP8, Louveiennes, France

PCT No. PCT/FR94/00809, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO95/01616, PCT Pub. Date Jan. 12, 1995

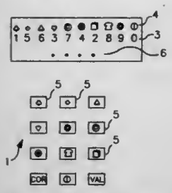
PCT Filed Jul. 1, 1994, Ser. No. 387,817

Claims priority, application France, Jul. 1, 1993, 93 08073

Int. Cl.[6] G07F *7/02*

U.S. Cl. 340—825.31 **15 Claims**

11. A terminal including a display and means to enter into the terminal a confidential piece of information furnished by a user,



said information including a plurality of authenticating signs which belong to a first set of authenticating signs (3), said terminal being operable to display said first series of authenticating signs and a second series of designating symbols (4) in such a way that each authenticating sign in the first series (3) is disposed opposite a designating symbol in the second series (4), said terminal further comprising:

means for using the designating symbols in the second series (4) to allow the user to designate the authenticating signs in the first series (3) which constitute said confidential information.

5,815,084

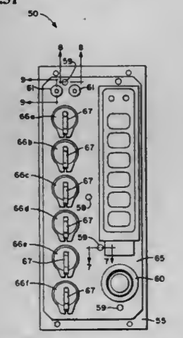
PROGRAMMER FOR CONTACT READABLE ELECTRONIC CONTROL SYSTEM AND PROGRAMMING METHOD THEREFOR

Gary E. Lavelle, Avon, and George Frolov, Farmington, both of Conn., assignors to Harrow Products, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 65,185, May 20, 1993, Pat. No. 5,537,103. This application May 31, 1996, Ser. No. 656,401

Int. Cl.[6] G08B *5/00*

U.S. Cl. 345—825.31 **20 Claims**



1. A programming and input signal device for programming and transmitting input signals for a programmable processor of a door security system, said device comprising:

key pad means for defining a key pad having a plurality of keys;

code means comprising a plurality of contact activatable data carriers, each data carrier having a conductive case and a data chip enclosed in said case, each data chip fixed with a unique elemental code, said code transmitted through said case;

address means for addressing said chips by said keys, said chips and said keys being configured in one-to-one correspondence; and

communication means for communicating the elemental code of an addressed chip to said programmable processor.

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5,815,085

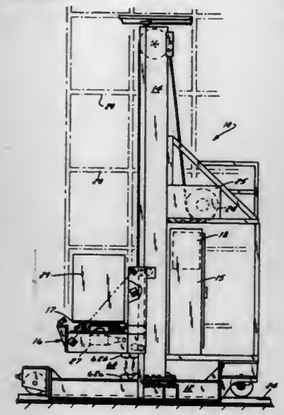
STORAGE AND RETRIEVAL MACHINE HAVING IMPROVED REAL-TIME RESPONSIVENESS AND IMPROVED NOISE IMMUNITY

Randall M. Schneider, Pewaukee, and Wesley Crucius, Brookfield, both of Wis., assignors to HK Systems, Inc., New Berlin, Wis.

Filed Nov. 16, 1995, Ser. No. 558,426

Int. Cl.[6] G05B *23/02;* **B65G** *1/00;* **H04Q** *5/22*

U.S. Cl. 340—825.5 **20 Claims**



1. A communication system for a storage and retrieval machine having a mast, a base and a carriage, said carriage being vertically movable along said mast, said communication system comprising:

a signal generator supplying a signal having positive and negative half-waves;

a conductor bar extending along said mast of said storage and retrieval machine to said carriage;

a base electrical device mounted to said base of said storage and retrieval machine;

a sliding brush, said sliding brush being mounted to said carriage, and said sliding brush being in slidable electrical contact with said conductor bar;

a carriage electrical device mounted to said carriage of said storage and retrieval machine;

a first transmitter and a first receiver, one of said first transmitter and said first receiver being coupled to said base electrical device and to said conductor bar, the other of said first transmitter and said first receiver being coupled to said carriage electrical device and to said sliding brush, said first transmitter being further coupled to said signal generator, and said first transmitter defining means for transmitting said positive half-waves across said conductor bar to said first receiver in response to an input of said first transmitter and thereby defining a first one-bit intra storage and retrieval machine communication link between said carriage electrical device and said base electrical device; and

a second transmitter and a second receiver, one of said second transmitter and said second receiver being coupled to said base electrical device and to said conductor bar, the other of said second transmitter and said second receiver being coupled to said carriage electrical device and to said sliding brush, said second transmitter being further coupled to said signal generator, and said second transmitter defining means for transmitting said negative half-waves across said conductor bar to said second receiver in response to an input of said second transmitter and thereby defining a second one-bit intra storage and retrieval machine communication link between said carriage electrical device and said base electrical device.

5,815,086

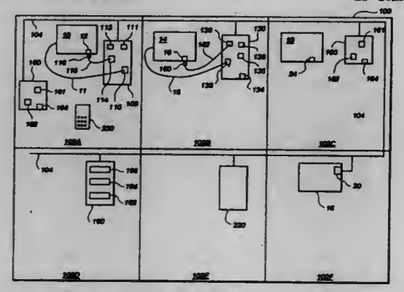
AUTOMATED APPLIANCE CONTROL SYSTEM

Lovell Brent Ivie, Sandy, and Daniel Gilstrap, Salt Lake City, both of Utah, assignors to IES Technologies, Inc., Sandy, Utah

Continuation of Ser. No. 326,684, Oct. 20, 1994, abandoned. This application Mar. 28, 1996, Ser. No. 623,668

Int. Cl.[6] H04B *1/00*

U.S. Cl. 340—825.52 **23 Claims**



1. A system for communicating instructions to an appliance from a remote location, the appliance being responsive to commands conveyed via an infrared signal, the system comprising:

remote means for dispatching a first control signal from the remote location;

means for receiving the first control signal;

means for translating the first control signal into a second control signal, the second control signal including at least a power on command;

means for emitting the second control signal, the means for emitting comprising means for generating infrared radiation which reaches the appliance, the second control signal being recognized by the appliance; and

means for sensing whether the appliance is in a power active state or a power-inactive state, the means for sensing comprising manually adjustable sensitivity means for varying the threshold of detected current drawn by the appliance when in a power active state and for ensuring that the power on command is issued by the means for emitting the second control signal only if the appliance is in a power-inactive state.

5,815,087

ANTI-THEFT SYSEM FOR A REMOVABLE ACCESSORY OF AN AUTOMOTVE VEHICLE

Scott O. Campbell, Canton; Paul Simmons, Chesterfield, and John F. Kennedy, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 2, 1996, Ser. No. 626,585

Int. Cl.[6] B60R *25/00;* **G06F** *7/00*

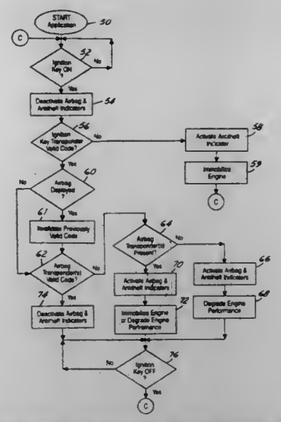
U.S. Cl. 340—825.54 **17 Claims**

1. An anti-theft system for a removable accessory of an automobile comprising:

a transponder located in said removable accessory, said transponder having a transponder security code;

a remote sensing coil operatively coupled to said transponder, wherein said remote sensing coil is adjacent said transponder when said removable accessory is in an unremoved position;

a memory storing a stored security code corresponding to said transponder;



a control module coupled to said remote sensing coil and said memory, said control module generating an interrogate signal and receiving a response signal through said remote sensing coil, said transponder generating said response signal in the form of a transponder security code in response to said interrogate signal, said control module comparing said transponder security code to said stored security code, and then if said transponder security code is not equal to said stored security code, disabling a predetermined function; and

output means coupled to said control module for providing an indication to a vehicle operator of said disabled predetermined function.

5,815,088

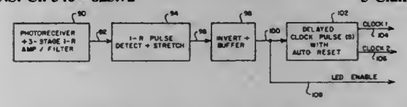
RF SWITCHING WITH REMOTE CONTROLLERS DEDICATED TO OTHER DEVICES

Fred R. Kurtz, 5698 Westbourne Ave., Columbus, Ohio 43213

Division of Ser. No. 488,999, Jun. 8, 1995, Pat. No. 5,574,440, which is a division of Ser. No. 174,224, Dec. 28, 1993, Pat. No. 5,491,472. This application Nov. 12, 1996, Ser. No. 748,132

Int. Cl.[6] G08C *19/00;* **H04B** *10/00*

U.S. Cl. 340—825.72 **5 Claims**



1. A remote control signal receiver for universally translating various remote control transmitters transmitting a code defining sequence of radiated spaced pulse signals, comprising:

a receiver network responsive to any given one of said sequence of radiated spaced pulse signals to derive a corresponding treated substantially continuous signal; and

a logic network responsive to the sustained presence of said treated pulse signal for at least a first predetermined interval of time to transition from an initial condition and derive a first switching output condition.

5,815,089

DEVICE FOR TRANSMITTING SIGNALS FROM POSITION DETECTOR AND METHOD OF SUCH SIGNAL TRANSMISSION

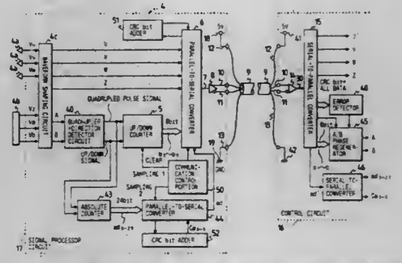
Takashi Katagiri, and Tetsuo Momose, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Division of Ser. No. 174,044, Dec. 28, 1993, Pat. No. 5,625,353. This application Jan. 13, 1997, Ser. No. 782,097

Clalms priority, application Japan, Dec. 29, 1992, P.HEI.4-361076; Jan. 11, 1993, P.HEI.5-19356; Jan. 21, 1993, U.M.HEI.5-4643; Jan. 21, 1993, P.HEI.5-26172; Mar. 25, 1993, P.HEI.5-90878; Mar. 31, 1993, P.HEI.5-96629

Int. Cl.[6] G08C *15/06*

U.S. Cl. 340—870.03 **10 Claims**



1. A device for transmitting position detector signals comprising:

a control unit for processing signals on various kinds of data from an object of interest;

a position detector that has a magnetic pole detecting portion and which detects position data of said object of interest;

an up-down counter that counts in an ascending or descending order on the basis of two-phase output signals that are produced from said position detector in accordance with the chance in the position of said object of interest;

a converting circuit portion in which both the counter value produced from said up-down counter or the chance in said counter value per unit time and a magnetic pole position detection signal produced from said magnetic pole detecting portion are converted to a serial signal;

a transmission path for transmitting said serial signal to said control unit;

a sensor that is located within or outside said position detector for detecting position data of said object of interest and which detects different data from said position data; and

superposing means by which different data that are detected with said sensor and said position detector and which are transmitted along said transmission path are superposed on the serial signal.

5,815,090

REMOTE MONITORING SYSTEM FOR DETECTING TERMITES

Nan-Yao Su, Plantation, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Filed Oct. 31, 1996, Ser. No. 741,952

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—870.16 **20 Claims**

1. A system to monitor for termites in a plurality of zones, comprising:

at least one termite sensor adapted for placement in each of said zones, each of said termite sensors including at least one monitoring block made of termite edible material and an electrical conductor positioned adjacent to or embedded in the at least one monitoring block, the electrical conductor being made of a material that is breakable by termite feeding, the electrical conductor forming a continuous electrical bridging

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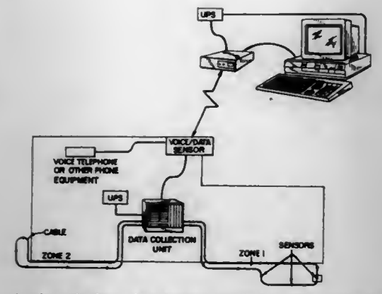


circuit such that when termite feeding breaks the electrical conductor, the continuous electrical bridging circuit is broken;

a data collection unit communicating with said at least one termite sensor in each zone independently of termite sensors in other zones, said data collection unit being capable of registering the presence of termites at any of said zones independently of other zones; and

a host processor for communicating with said data collection unit from a remote location to retrieve data relating to the presence of termites.

5,815,091

POSITION ENCODER

Andrew N. Dames, Cambridge; David T. Ely, Harston, and Andrew R. L. Howe, Stansted, all of Great Britain, assignors to Scientific Generics Limited, Cambridgeshire, Great Britain

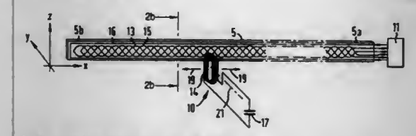
PCT No. PCT/GB95/01095, § 371 Date Dec. 12, 1996, § 102(e) Date Dec. 12, 1996, PCT Pub. No. WO95/31696, PCT Pub. Date Nov. 23, 1995

PCT Filed May 15, 1995, Ser. No. 737,505

Claims priority, application United Kingdom, May 14, 1994, 9409711; Aug. 26, 1994, 9417353; Oct. 3, 1994, 9420597; Nov. 25, 1994, 9423861

Int. Cl.[6] G08C *21/00*

U.S. Cl. 340—870.34 **53 Claims**



1. A position detector including:

first and second members mounted for relative movement along a measuring path;

said first member comprising a first circuit having at least two loops arranged in succession along said measuring path, each loop extending along said path and said loops being connected in series and being arranged so that EMFs induced in adjacent said loops by a common background alternating magnetic field oppose each other, and a second circuit extending along said measuring path;

said second member comprising means for interacting with said circuits such that in response to an input driving signal applied to one of said circuits there is induced in the other said circuit an output signal, said interacting means and said at least two loops being arranged so that said output signal continuously varies as a function of their relative position along said path;

characterized in that said interacting means comprises an electromagnetic resonant device arranged so that, in operation, an intermediate signal (Ir) is induced therein by said input driving signal applied to said one circuit and so that said intermediate signal induces said output signal in said other circuit.

5,815,092

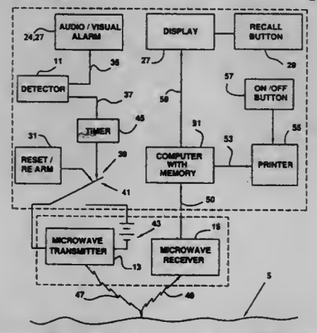
COMBINED SPEED MEASURING DEVICE DETECTOR, SPEED MEASURING DEVICE AND PRINTER FOR VERIFYING VEHICLE SPEED

Eugene Stuart Gregg, III, 20 Sally Port Rd., Hilton Head Island, S.C. 29928, and James A. Mittler, P.O. Box 132, Bluffton, S.C. 29910

Filed Apr. 22, 1997, Ser. No. 844,875

Int. Cl.[6] G08G *1/01*

U.S. Cl. 340—936 **17 Claims**



1. A system mountable in a vehicle for verifying vehicle speed, comprising:

a) detector means for detecting signals indicative of nearby use of a speed measuring device;

b) measuring means for measuring speed of said vehicle;

c) receiver means for receiving further signals related to said speed, said signals being transmitted to a computer with memory;

d) said computer with memory receiving said signals and calculating and storing vehicle speed.

5,815,093

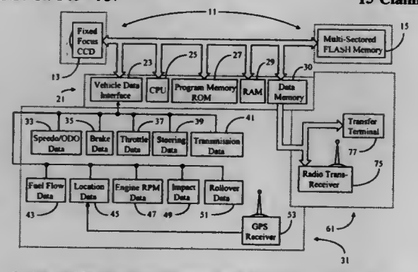
COMPUTERIZED VEHICLE LOG

Dan Kikinis, Saratoga, Calif., assignor to Lextron Systems, Inc., Saratoga, Calif.

Filed Jul. 26, 1996, Ser. No. 686,519

Int. Cl.[6] G08G *1/017*

U.S. Cl. 340—937 **15 Claims**



1. An accident recording system for a vehicle, comprising:

a digital camera;

a flash memory having a limited number of sectors for recording digital images, one image per sector;

a microcontroller connected to the digital camera and the flash memory; and

an interrupter connected to the microcontroller;

wherein the microcontroller accesses images from the digital camera periodically, stores the images sequentially in the sectors of the flash memory, and, after the last sector in the sequence is stored, overwrites the oldest sector with each new image, and wherein the interrupter terminates operation of the vehicle accident recording system, thereby providing a visual record of a specific and limited period of time immediately preceding an accident.

5,815,094

POSITION DETECTING DEVICE

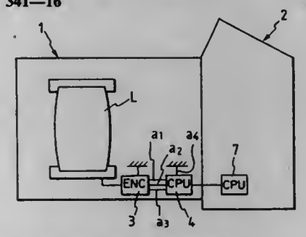
Hiroshi Okano, Tokyo; Yoshiharu Shiokama, Chiba-ken; Shinichi Ushio, and Kazumitsu Takezawa, both of Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 723,506, Sep. 30, 1996, abandoned, which is a continuation of Ser. No. 546,063, Oct. 20, 1995, abandoned, which is a continuation of Ser. No. 322,373, Oct. 13, 1994, abandoned, which is a continuation of Ser. No. 226,374, Apr. 12, 1994, abandoned, which is a continuation of Ser. No. 883,572, May 15, 1992, abandoned. This application Oct. 28, 1997, Ser. No. 958,478

Claims priority, application Japan, May 21, 1991, 3-145591; May 21, 1991, 3-145592; Jul. 15, 1991, 3-063081

Int. Cl.[6] H03M *1/22*

U.S. Cl. 341—16 **20 Claims**



1. A position detecting device comprising:

a member having conductive patterns arranged in plural tracks;

a sliding member having plural sliding pieces which slide on said conductive patterns, wherein each of said sliding pieces assumes either a conductive state in contact with a corresponding one of the conductive patterns or a non-conductive state not in contact with said corresponding conductive pattern, depending upon position of said sliding member relative to said member having conductive patterns;

signal process means for repeatedly detecting which of said sliding pieces are in the conductive state; and

discrimination means for identifying a relative position between said member having conductive patterns and said sliding member in response to detection, by said signal process means, at least a predetermined plural number of times, of a same group of said sliding pieces being in the conductive state.

5,815,095

SURVEYING INSTRUMENT

Kiyoshi Yamamoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1996, Ser. No. 629,579

Claims priority, application Japan, Apr. 10, 1995, 7-084363

Int. Cl.[6] H03K *17/94;* **H03M** *11/00*

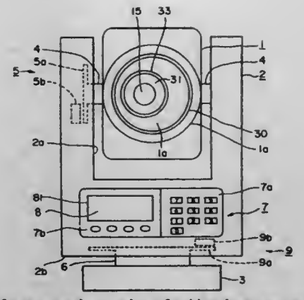
U.S. Cl. 341—22 **13 Claims**

1. A surveying instrument comprising:

an operating portion having a number of keys including at least one specific key assigned to a specific function;

an indicating means for producing an indication corresponding to said specific key;

a first indication mode switching means for changing said indication from a first indication mode to a second indication mode upon said specific key being actuated once, the necessity for a second operation of said at least one specific key being visually indicated during a predetermined time limit;



a second indication mode switching means for changing said indication from said second indication mode to said first indication mode after said predetermined time limit has elapsed; and

a function performing means for performing said specific function if said specific key is actuated a second time within said predetermined time limit;

wherein said indication mode changes from said second indication mode to said first indication mode upon said specific key being actuated a second time.

5,815,096

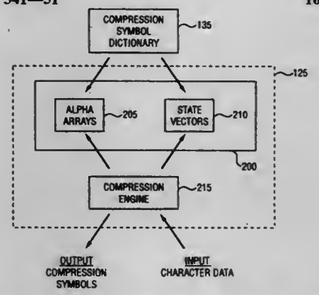
METHOD FOR COMPRESSING SEQUENTIAL DATA INTO COMPRESSION SYMBOLS USING DOUBLE-INDIRECT INDEXING INTO A DICTIONARY DATA STRUCTURE

Jeffrey D. Smith, Houston, Tex., assignor to BMC Software, Inc., Houston, Tex.

Filed Sep. 13, 1995, Ser. No. 527,687

Int. Cl.[6] H03M *7/40*

U.S. Cl. 341—51 **10 Claims**



1. A machine-executed method for compressing a sequence of characters into a compression symbol, each character in said sequence of characters having a numerical character value between 0 and 255, said compression symbols being selected from a machine-readable dictionary of compression symbols organized in a Ziv-Lempel tree format, said method comprising:

(a) providing (1) a set of fixed-length array representations in a memory referred to as ALPHA arrays, and (2) a set of variable-length array representations in a memory referred to as state vectors;

each said ALPHA array having 256 entries, one for each character in said set of characters, and comprising either (1) an invalid-character indication or (2) an index into a state vector associated with said ALPHA array, and

each said state vector comprising (1) a compression symbol and (2) zero or more pairs of transition indicators, wherein each

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pair of transition indicators comprises (i) a next-state-vector indicator and (ii) a next-ALPHA-array indicator;

(b) defining one of said state vectors as a current state vector and defining one of said ALPHA arrays as a current ALPHA array;

(c) reading a character from said sequence of characters and defining said character as a current input character;

(d) retrieving from said current ALPHA array the entry corresponding to said current input character's character value, said retrieved entry value referred to as a translation entry;

(e) if said translation entry is an invalid-character indicator, then outputting the compression symbol contained in the current state vector, else

(1) retrieving, from said current state vector at a position indicated by said translation entry, the next-state-vector indicator and the next-ALPHA-array indicator;

(2) defining the state vector identified by said next-state-vector indicator as the current state vector and defining the ALPHA array identified by said next-ALPHA-array indicator as the current ALPHA array; and

(3) if said sequence of characters contains a next character, then defining said next character as said current input character and repeating the actions described in paragraphs (d) through (e), else outputting the compression symbol contained in the current state vector.

5,815,097

METHOD AND APPARATUS FOR SPATIALLY EMBEDDED CODING

Edward L. Schwartz, Sunnyvale; Ahmad Zandi, Cupertino, and Tibor Boros, Stanford, all of Calif., assignors to Ricoh Co. Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Filed May 23, 1996, Ser. No. 652,380

Int. Cl.[6] H03M *7/00*

U.S. Cl. 341—51 **53 Claims**

1. A system comprising:

a one-pass spatially embedded compressor that compresses first image data into compressed data, wherein the compressor comprises

an encoder having a spatially embedded context model, wherein the encoder operates in the spatial domain to encode first image data, and

a coded data manager, coupled to the encoder, that determines which portion of the compressed data to forward based on available channel bandwidth; and

a resource coupled to the compressor to transmit the compressed data.

5,815,098

CIRCUIT AND METHOD FOR EFFICIENTLY EXPANDING COMPRESSED DATA STORED IN MEMORY

Toyofumi Takahashi; Toshio Tanaka, and Hideaki Terakawa, all of Hyogo, Japan, assignors to Creative Design, Inc., Hyogo, and Nintendo Co., Ltd., Kyoto, both of Japan

PCT No. PCT/JP95/01959, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO96/10788, PCT Pub. Date Apr. 11, 1996

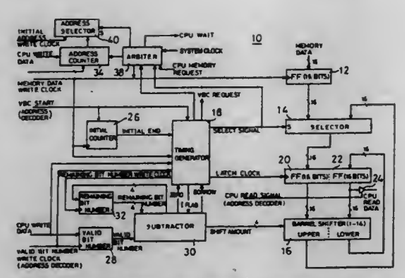
PCT Filed Sep. 27, 1995, Ser. No. 647,962

Claims priority, application Japan, Sep. 30, 1994, 6-236971

Int. Cl.[6] H03M *7/40*

U.S. Cl. 341—67 **18 Claims**

1. A compressed data expanding circuit, comprising:



a first 1-word register which holds compressed data applied from a memory in a bit-parallel fashion;

a second 1-word register which receives, for holding, the compressed data from said first register in a bit-parallel fashion;

a third 1-word register which in operation is loaded with a variable bit-length code composed of valid bits and non-valid bits;

a comparison means which compares the number of valid bits with the number of remaining bits of the data held in said second register to output a comparison signal based on the result of comparison and sets a shift amount corresponding to the comparison signal;

a barrel shift means which in operation is loaded with the data of the second register as high order data and the data of said third register as lower order data to barrel shift by the shift amount both of the higher order data and the lower order data in response to the shift amount outputted from said comparison means, and thereafter supplies the higher order data to said second register and the lower order data to said third register;

a selecting signal output means which outputs a selecting signal for selecting one of the compressed data in said first register and the higher order data in said barrel shift means in response to the comparison signal outputted from said comparison means

a selecting means which selectively outputs one of the compressed data in said first register and the higher order data in said barrel shift means based on the selecting signal so as to load to said second register in a bit parallel fashion; and

an output means which withdraws a variable bit-length code in which the non-valid bits are added to said compressed data.

5,815,099

METHOD AND APPARATUS FOR DIFFERENTIALLY DECODING SIGNALS

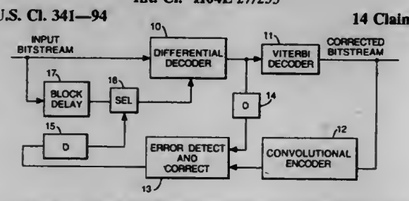
Jeff Gledhill; Santosh Anikhindi, and Graham William Cradock, all of Hampshire, United Kingdom, assignors to Digi-Media Vision Ltd., Middlesex, United Kingdom

Filed Oct. 23, 1996, Ser. No. 736,379

Claims priority, application United Kingdom, Mar. 18, 1996, 9522241

Int. Cl.[6] H04L *27/233*

U.S. Cl. 341—94 **14 Claims**



1. Apparatus for decoding a differentially encoded input signal having forward error correction added to the encoded data, the apparatus comprising:

a differential decoder to receive the input signal and to decode the data in each differentially encoded signal interval thereof by reference to the data in a previous differentially encoded signal interval;

an error correcting circuit for correcting errors in the decoded signal from the decoder; and

a feedback loop for supplying to the decoder the error corrected decoded data from each signal interval to act as a reference for decoding the data in a following signal interval.

5,815,100

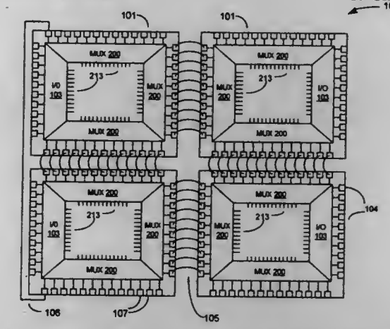
VOLTAGE MULTIPLEXED CHIP I/O FOR MULTI-CHIP MODULES

Kenneth Rush; Eldon Cornish, and Steve Draving, all of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 4, 1996, Ser. No. 657,987

Int. Cl.[6] H03M *1/00*

U.S. Cl. 341—410 **13 Claims**



1. An electrical interconnect between a plurality of output nodes of a first integrated circuit (IC) and a plurality of input nodes of a second IC, the interconnect comprising:

a first bond pad located on the first integrated circuit;

a second bond pad located on the second integrated circuit;

a first digital-to-analog converter located on the first integrated circuit and having an output coupled to the first bond pad and receiving a plurality of binary inputs from the output nodes of the first integrated circuit:

a first analog-to-digital converter located on the second integrated circuit and coupled to the second bond pad and having an output line coupled to each of the plurality of input nodes of the second IC.

5,815,101

METHOD AND SYSTEM FOR REMOVING AND/OR MEASURING ALIASED SIGNALS

Gerard C. A. Fonte, 3985 Tonawanda Creek Rd., East Amherst, N.Y. 14051

Filed Aug. 2, 1996, Ser. No. 691,877

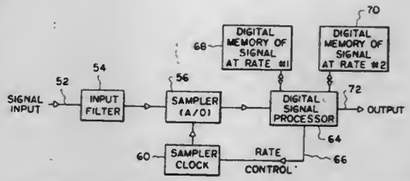
Int. Cl.[6] H03M *1/00*

U.S. Cl. 341—123 **18 Claims**

1. A method for separating aliased signals from non-aliased signals in a sampling method wherein an input analog signal includes frequency components above the Nyquist limit comprising:

a) sampling the input analog signal at a first sampling rate to provide a first sampled signal;

b) sampling the input analog signal at a second sampling rate different from the first sampling rate to provide a second sampled signal;



c) said steps of sampling the input analog signal at said first and second sampling rates being performed asynchronously; and

d) comparing the spectral patterns of the first and second sampled signals to separate the aliased signals from the non-aliased signals.

5,815,102

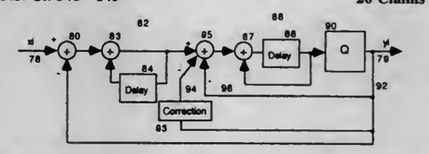
DELTA SIGMA PWM DAC TO REDUCE SWITCHING

John Laurence Melanson, Boulder, Colo., assignor to Audio-Logic, Incorporated, Boulder, Colo.

Filed Jun. 12, 1996, Ser. No. 662,873

Int. Cl.[6] H03M *3/00*

U.S. Cl. 341—143 **26 Claims**



9. A digital to analog (D/A) converter for converting a medium rate, high resolution digital signal into an analog signal, said converter comprising:

a delta sigma modulator of at least second order including at least two feedback loops carrying a feedback signal for converting the medium rate, high resolution digital signal into a medium rate, medium resolution digital signal;

a duty cycle demodulator connected to the delta sigma modulator for converting the medium rate, medium resolution digital signal into a high rate, low resolution digital signal; and

D/A means connected to the duty cycle demodulator for converting the high rate, low resolution digital signal into the analog signal;

wherein the duty cycle demodulator includes means for formatting the high rate, low resolution digital signal into a predetermined low transition rate format; and

wherein the delta sigma modulator includes:

means for selecting different correction factors to be applied to at least two of the feedback loops based upon the predetermined low transition rate format and the feedback signal; and

means for applying different correction factors to at least two of the feedback loops.

5,815,103

ACCURATE DIGITAL-TO-ANALOG CONVERTER

Martial Comminges, Grenoble; Francis Dell'Ova, Saint Hilaire Du Touvet, and Frédéric Paillardet, Grenoble, all of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Apr. 16, 1996, Ser. No. 634,306

Claims priority, application France, Apr. 28, 1995, 95 05367

Int. Cl.[6] H03H *1/66*

U.S. Cl. 341—144 **35 Claims**

1. A digital to analog converter comprising:

a plurality of pairs of positive and negative current sources, each current source of the plurality of pairs of positive and negative

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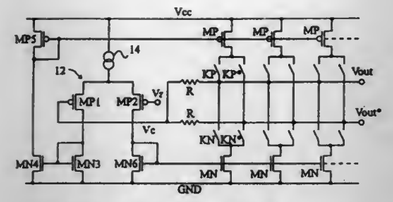


current sources being connected through respective switches to two differential output lines, the respective switches being controlled as a function of a digital data, each pair of the plurality of pairs of positive and negative current sources including a pair of transistors of an output stage of a transconductance amplifier, the transconductance amplifier having an inverting input and a non-inverting input, the non-inverting input receiving a reference voltage, and the inverting input receiving a voltage at a middle node of a bridge of series-connected resistors that are connected between the two differential output lines, the output of the digital to analog converter being a voltage between the two differential output lines.

5,815,104

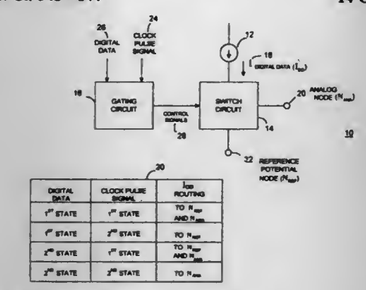
METHOD AND APPARATUS FOR DIGITAL TO ANALOG CONVERSION

H. Spence Jackson, Austin, and Michael A. Margules, Dripping Springs, both of Tex., assignors to Sigmatel, Inc., Austin, Tex.

Filed Mar. 20, 1997, Ser. No. 821,097

Int. Cl.[6] H03M *1/66*

U.S. Cl. 341—144 **14 Claims**



1. A digital to analog converter comprising:

a current source, wherein current provided by the current source is representative of digital data;

a switch circuit operably coupled to the current source, a reference potential node, and an analog node, wherein the analog node supports an analog representation of the digital data; and

a gating circuit operably coupled to the switching circuit, wherein the gating circuit receives, as inputs, a clock pulse signal and the digital data, wherein the gating circuit provides controlling signals to the switch circuit that causes the switch circuit to route current from the current source to both the reference potential node and the analog node when the clock pulse signal is in a first state, causes the switch circuit to route the current to the reference potential node when the digital data is in a first state and the clock pulse signal is in a second state, and causes the switch circuit to route the current to the analog node when the digital data is in a second state and the clock pulse signal is in the second state.

5,815,105

ANALOG-TO-DIGITAL CONVERTER WITH WRITABLE RESULT REGISTER

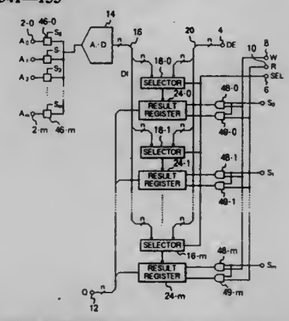
Mitsuya Ohie, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1995, Ser. No. 562,118

Claims priority, application Japan, Nov. 25, 1994, 6-291468

Int. Cl.[6] H03M *1/00*

U.S. Cl. 341—155 **10 Claims**



1. An analog-to-digital converter circuit, comprising:

an analog input port for receiving an external analog signal;

a digital input port for receiving an external digital signal having a plurality of parallel bits;

a first control port for receiving a first selection signal;

a second control port for receiving a second selection signal;

a conversion circuit coupled to said analog input port, for converting said external analog signal to an internal digital signal having a plurality of parallel bits;

a first selector coupled to said conversion circuit and said digital input port, said first selector receiving said external digital signal and said internal digital signal in parallel form, said first selector selecting one signal from said internal digital signal and said external digital signal in response to said first selection signal;

a second selector coupled to said conversion circuit and said digital input port, said second selector receiving said external digital signal and said internal digital signal in parallel form, said second selector selecting one signal from said internal digital signal and said external digital signal in response to said second selection signal;

first result register coupled to said first selector for storing the signal selected by said first selector;

a second result register coupled to said second selector for storing the signal selected by said second selector; and

a digital output port for parallel output of the signal stored in said first result register and the signal stored in said second result register.

5,815,106

SPLIT FLASH ANALOG TO DIGITAL CONVERTER DIFFERENTIAL DRIVER

Joe Martin Poss, Rochester, and Timothy Joseph Schmerbeck, Kasson, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

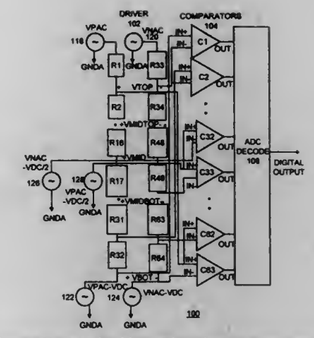
Filed Oct. 9, 1996, Ser. No. 728,044

Int. Cl.[6] H03M *1/36*

U.S. Cl. 341—159 **11 Claims**

1. A high speed differential analog to digital converter (ADC) comprising:

a driver section including a pair of series connected resistor ladders; a pair of positive phase voltage sources connected at the top and bottom of one of said pair of series connected resistor ladders; a pair of negative phase voltage sources connected at the top and bottom of the other one of said pair of series connected resistor ladders; both said positive phase



voltage source and said negative phase voltage source including a predetermined first DC voltage value;

a comparator section including a series string of comparators; a differential input signal at respective center taps between series connected resistors of said pair of series connected resistor ladders coupled into an inverting input and a non-inverting input of respective comparators; and

a decode section; outputs of said series string of comparators coupled to said decode section for providing a digital output;

said high speed differential analog to digital converter (ADC) being characterized by:

an additional positive phase voltage source connected to a middle of said one of said pair of series connected resistor ladders, said additional positive phase voltage source being in phase with said pair of positive phase voltage sources, and an additional negative phase voltage source connected to a middle of said other one of said pair of series connected resistor ladders, said additional negative phase voltage source being in phase with said pair of negative phase voltage sources; both said one additional positive phase voltage source and said additional negative phase voltage source having a predetermined second DC voltage value; said predetermined second DC voltage value equals one half of said predetermined first DC voltage value.

5,815,107

CURRENT SOURCE REFERENCED HIGH SPEED ANALOG TO DIGITIAL CONVERTER

Richard Francis Frankeny, Elgin, and Mithkal Moh'd Smadi, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1996, Ser. No. 770,603

Int. Cl.[6] H03M *1/36;1/42*

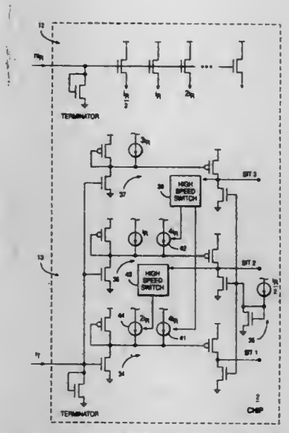
U.S. Cl. 341—159 **10 Claims**

1. Analog to digital converter responsive to an input current, comprising:

means for generating an input signal proportioned to the analog input current as received in an integrated circuit chip;

means for using the generated input signal in two or more parallel channels to concurrently compare in each of the parallel channels the analog input current with multiples of a reference current, the parallel channels being individually associated with digital output bits of the integrated circuit chip; and

means for feedback switching, during the concurrent compare selected ones of the reference current multiples in a parallel



channel responsive to a state of a digital output bit at a higher level of significance.

5,815,108

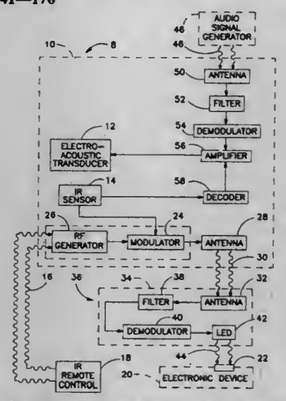
SYSTEM FOR EXTENDING INFRARED REMOTE CONTROL

Neil Terk, Laurel Hollow, N.Y., assignor to Terk Technologies Corporation, Commack, N.Y.

Filed Dec. 18, 1996, Ser. No. 768,673

Int. Cl.[6] H04B *9/00*

U.S. Cl. 341—176 **25 Claims**



1. An infrared remote control extension system for effecting control of an electronic device having an infrared sensor for receiving an infrared control signal from a manually actuated remote control, the assembly comprising:

an audio speaker assembly including an electro-acoustic transducer, said transducer being operatively coupled to an audio reproduction system;

an infrared sensor at least indirectly attached to said speaker assembly for receiving and converting the infrared control signal from the remote control to an electrical signal;

a signal generator operatively connected to said sensor for generating an RF carrier signal containing or carrying control information encoded in said infrared control signal and said electrical signal;

transmission means for transmitting the RF carrier signal from said signal generator to the electronic device; and

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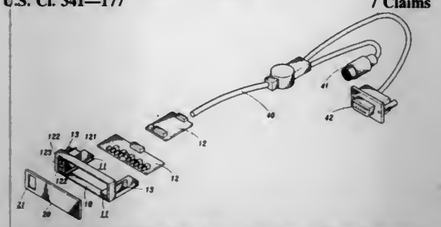
a signal receiver at the electronic device for receiving and converting the RF carrier signal transmitted from said signal generator to a secondary infrared signal essentially identical to said infrared control signal, said signal receiver being disposed adjacent to the infrared sensor of the electronic device.

5,815,109

TRANSMITTER/RECEIVER MODULE OF CORDLESS KEYBOARD ASSEMBLY

Tom Tan, Taipei, Taiwan, assignor to Behavior Tech Computer Corporation

Filed Aug. 25, 1997, Ser. No. 916,783
Int. Cl.[6] G08C *19/12*
U.S. Cl. 341—177 **7 Claims**



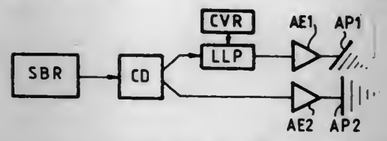
1. A transmitter/receiver module of cordless keyboard assembly comprising a frame which is sized to be received within a disk driver slot formed on a front panel of a computer casing, the frame having two opposite lateral sides each having a slot opposite to each other to receive and hold therein a transmitter/receiver circuit module therein, each of the two lateral sides having a resilient catch provided thereon to respectively engage a side wall of the disk driver slot so as to hold the frame in the disk driver slot, the circuit module being connected to a computer circuit board via a control circuit which comprises an output cable having one end electrically connected to the control circuit and an opposite end electrically connected to the computer circuit board.

5,815,110

JAMMING METHOD

Jean-François Morand, Saint-Cloud, France, assignor to Electronique Serge Dassault, Saint-Cloud, France

Filed Jnl. 25, 1988, Ser. No. 228,332
Claims priority, application France, Jul. 24, 1987, 87 10591
Int. Cl.[6] G01S *7/38*
U.S. Cl. 342—14 **13 Claims**



1. A method for jamming radar, said radar having an estimated response time to jammer cancellations, comprising the steps of:

transmitting at least two jamming electromagnetic signals, each signal having different polarizations and being subject to fast time variations with respect to each other signal, said signals originating from the same jamming source;

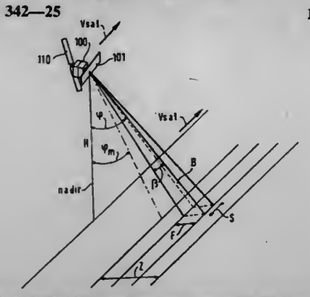
providing one of said two signals with at least one of a time shift and a variable phase shift with time, wherein said providing step time shift and phase shift is faster than the radars estimated response time to jammers cancellation.

5,815,111

METHOD OF REDUCING AMBIGUITIES IN SYNTHETIC APERTURE RADAR, AND RADAR IMPLEMENTING THE METHOD

Sophie Gouenard, Toulouse, and Noël Suinot, Escalquens, both of France, assignors to Alcatel Espace, Nanterre Cedex, France

Filed Jun. 14, 1996, Ser. No. 664,174
Claims priority, application France, Jun. 15, 1995, 95 07147
Int. Cl.[6] G01S *13/00*
U.S. Cl. 342—25 **16 Claims**



1. A method of defocusing range ambiguities in a pulse synthetic aperture radar (SAR), the method comprising the following steps:

spreading radar pulses on transmission by using a plurality of "chirp" rules for varying the frequency of the transmitted wave as a function of time, said plurality of chirp rules including a non-linear chirp rule comprising a non-linear frequency variation of the transmitted wave of a pulse as a function of time;

during transmission of successive pulses, alternating chirp rules between chirps that rise and chirps that fall in the frequency/time plane of the pulse; and

compressing received echoes by matched filtering using a correlation operation between the received echo signal and the chirp rule that was applied at the time of transmission of the pulse that gave rise to said echo signal,

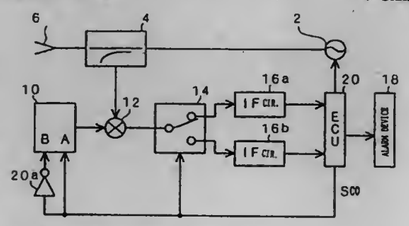
said method being characterized in that said plurality of rules for varying the frequency of the transmitted wave as a function of time comprise a number M of said rules, with M being an integer greater than or equal to 3.

5,815,112

PLANAR ARRAY ANTENNA AND PHASE-COMPARISON MONOPULSE RADAR SYSTEM

Kunihiko Sasaki, Kuwana; Masanobu Yukumatsu, Kariya; Toshiya Saito, Hekinan; Hideo Matsuki, Kariya, and Hiroshi Hazumi, Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 5, 1996, Ser. No. 759,528
Claims priority, application Japan, Dec. 5, 1995, 7-316736
Int. Cl.[6] G01S *13/44;13/93*
U.S. Cl. 342—70 **9 Claims**



1. A planar array antenna comprising:

a plurality of antenna elements disposed in a predetermined matrix pattern;

feeder means comprising feeders for supplying electric power to said antenna elements;

switching means for opening or closing feeders of said feeder means connected to antenna elements constituting at least one row located at both a right end region and a left end region of said matrix pattern; and

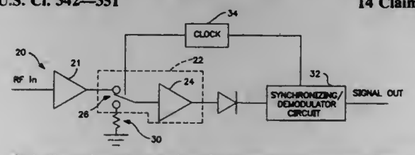
switching terminal means for supplying switching signals to said switching means for alternately activating said antenna elements disposed along the rows in the right end region and the left end region of said matrix pattern, thereby providing two array antennas which are offset in position by a distance corresponding to a width of said at least one row of the antenna elements controlled by said switching means and activated in a time-divisional fashion.

5,815,113

MONOLITHIC, LOW-NOISE, SYNCHRONOUS DIRECT DETECTION RECEIVER FOR PASSIVE MICROWAVE/MILLIMETER-WAVE RADIOMETRIC IMAGING SYSTEMS

Chung-Wen Dennis Lo, Foster City; Barry R. Allen, Redondo Beach; Eric W. Lin; Gee Samuel Dow, both of Rancho Palos Verdes, and Paul Shu Chung Lee, La Palma, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 13, 1996, Ser. No. 696,451
Int. Cl.[6] G01S *3/02*
U.S. Cl. 342—351 **14 Claims**



8. A direct detection receiver for a passive radiometric imaging system, the receiver comprising:

an input port adapted to receive a microwave or millimeter wave signal;

a front-end low-noise amplifier coupled to said input port for amplifying said input signal;

means for generating one or more reference signals;

a switched amplifier circuit for switching said one or more reference signals and said input signal;

a detector coupled to said switched amplifier circuit for receiving said RF signals from said switched amplifier circuit; and

a demodulator circuit for synchronizing the output signal from said detector with said switched amplifier circuit for producing a demodulated output signal.

5,815,114

POSITIONING SYSTEM AND METHOD

Jerry A. Speasl, Pleasanton, and Leonard Schupak, Mission Viejo, both of Calif., assignors to Discovision Associates, Irvine, Calif.

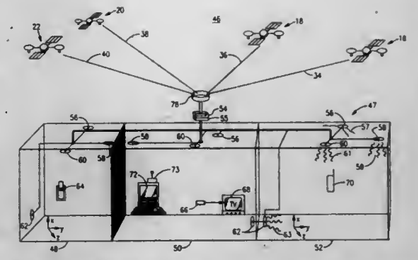
Filed Apr. 5, 1996, Ser. No. 628,360
Int. Cl.[6] G01S *5/02;* **H04B** *7/185*
U.S. Cl. 342—357 **16 Claims**

1. A location positioning system for use in a shielded environment, said system comprising:

a GPS receiver for receiving GPS signals having navigational data encoded therein;

a clock recovery unit that constructs a clock signal using said navigational data, wherein said clock signal accurately represents a local time;

a computer processing unit for receiving said clock signal and said navigational data; and



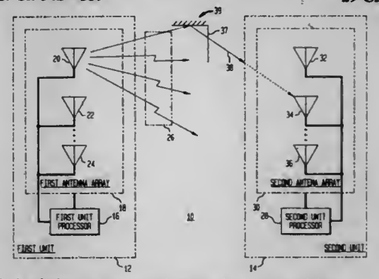
at least four pseudosatellites positioned within the shielded environment, one of said at least four pseudosatellites being non-coplanar relative to the others, wherein said computer processing unit generates a respective GPS-type signal corresponding to each of said at least four pseudosatellites, said respective GPS-type signal containing new orbital parameters for each corresponding pseudosatellite.

5,815,115

HIGH SPEED WIRELESS TRANSMITTERS AND RECEIVERS

Manuel J. Carloni, Holmdel; Michael James Gans, Monmouth Beach, and Peter Wasily Wolniansky, Ocean Grove, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 26, 1995, Ser. No. 578,292
Int. Cl.[6] H01Q *3/00*
U.S. Cl. 342—359 **29 Claims**



1. A wireless telecommunications device comprising:

an antenna array having at least two antenna elements, each antenna element providing beam coverage in both azimuthal and elevational directions; and

a processor operatively connected to the antenna array for determining a communication path meeting a predetermined signal power and delay of received signals with respect to one of the at least two antenna elements.

5,815,116

PERSONAL BEAM CELLULAR COMMUNICATION SYSTEM

Barry Dunbridge, Torrance, and Robert Y. Huang, Rolling Hills, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 29, 1995, Ser. No. 592,749
Int. Cl.[6] H01Q *3/24;3/26*
U.S. Cl. 342—373 **18 Claims**

1. A cellular communication system for transmitting adjustable personalized communication beams in individual directions of a plurality of users located within a geographical cell of the cellular communication system, each of the adjustable personalized com-

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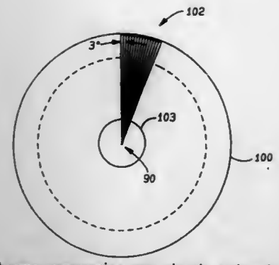


munication beams representing user signals assigned to specific users within the geographical cell, comprising:

phased array antenna means, positioned within the geographical cell, for transmitting and receiving the adjustable personalized communication beams;

digital beam forming means for feeding the phased array antenna means with the user signals forming the adjustable personalized communication beams for transmission in the individual directions of the plurality of users and for receiving the user signals received by the phased array antenna means; and

user tracking means for providing user tracker information to the digital beam forming means, said user tracking information being a function of at least one user location vector referenced to a center of each adjustable personalized communication beam, whereby the digital beam forming means adjusts each of the user signals in response to the user tracking information so that each of the adjustable personalized communication beams is substantially centered about one of the users.

5,815,117

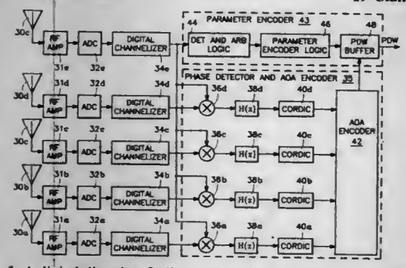
DIGITAL DIRECTION FINDING RECEIVER

James C. Kolanek, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 2, 1997, Ser. No. 778,053

Int. Cl.[6] G01S *5/04*

U.S. Cl. 342—442 **19 Claims**



1. A digital direction finding receiver having N frequency channels spanning a frequency band of said receiver, said receiver capable of receiving signals simultaneously from a plurality of antennas spaced from one another, one of said antennas comprising a reference location antenna, said receiver comprising:

a plurality of analog-to-digital converters having their analog inputs connected to respective ones of said antennas;

a reference source capable of outputting a reference digital signal containing at least a local frequency component within a selected one of said N frequency channels;

a plurality of digital down converter modules, each one of said digital down converter modules having a reference input connected to said reference source and a signal input connected to the digital output of a respective one of said analog-to-digital converters, each said digital down converter modules comprising a multiplier for producing at an output of said digital down converter a product of said reference signal and the signal from the respective one of said antennas; and

a digital phase detector having plural phase detector signal inputs connected to the outputs of remaining ones of said digital down converters, said phase detector detecting phase angles of signals on each of said phase detector signal inputs relative to a corresponding signal received at said reference antenna.

5,815,118

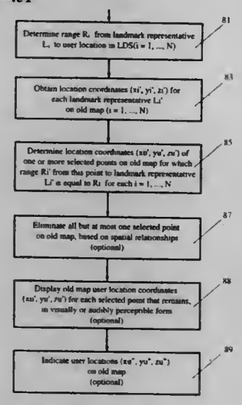
RUBBER SHEETING OF A MAP

John F. Schipper, Palo Alto, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Continuation of Ser. No. 333,855, Nov. 3, 1994, Pat. No. 5,581,259. This application Nov. 29, 1996, Ser. No. 757,614

Int. Cl.[6] G01S *3/02*

U.S. Cl. 342—451 **12 Claims**



1. A method for determining the coordinates of a location in a region, with reference to a map that may be inaccurate and that indicates the locations of at least first and second landmarks, the method comprising the steps of:

receiving location determination (LD) signals at an LD unit, from each of a plurality of LD signal sources, where the LD unit can estimate the LD unit location and can estimate a vector from the LD unit location to a selected location that is visible to and spaced apart from the LD unit, and using the LD unit to estimate the LD unit location and to estimate first and second separation vectors from the LD unit to selected first and second visible landmarks, respectively, whose locations are shown on a map;

computing coordinates on the map of a location with vectors from the computed location to the first landmark and second landmark on the map that are approximately equal to the first separation vector and to the second separation vector, respectively; and

interpreting the computed location coordinates as candidate coordinates for the LD unit on the map.

5,815,119

INTEGRATED STACKED PATCH ANTENNA POLARIZER

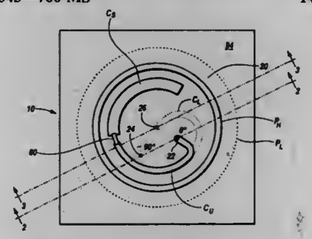
CIRCULARLY POLARIZED INTEGRATED STACKED DUAL-BAND PATCH ANTENNA

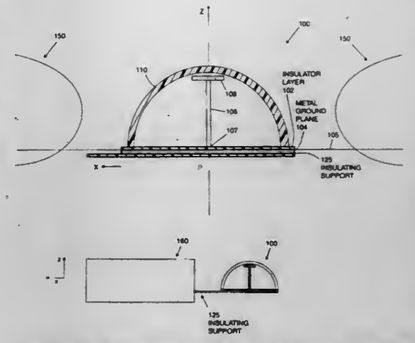
Darrell L. Helms, Seminole; James R. Sherman, and Barry B. Pruett, both of St. Petersburg, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 8, 1996, Ser. No. 694,855

Int. Cl.[6] H01Q *1/38;21/24*

U.S. Cl. 343—700 MS **14 Claims**





1. A stacked patch antenna comprising:

a lo-band patch having a first side and a second side;

a hi-band patch having a first side and a second side, said hi-band patch mounted adjacent with the second side adjacent to the first side of the lo-band patch; and

a 90° microstrip coupler having a first layer and a second layer, said coupler mounted adjacent to the first side of the hi-band patch, said coupler including:

an input terminal,

a 0° output terminal,

a −90° output terminal,

a lower coupler strip disposed in an arcuate configuration between the first layer of the coupler and the second layer of the coupler, said lower coupler strip connected to the input terminal and the −90° output terminal, and

an upper coupler strip disposed in an arcuate configuration on the first layer of the coupler, said upper coupler strip connected to the 0° output terminal, and

wherein said microstrip coupler generates two output quadrature signals fed to the hi-band patch and lo-band patch to produce circular polarization.

5,815,120

RADIO FREQUENCY LOCAL AREA NETWORK ADAPTER CARD STRUCTURE AND METHOD OF MANUFACTURE

Mark John Lawrence, and William B. Nunnery, both of Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1996, Ser. No. 608,229

Int. Cl.[6] H01Q *1/24*

U.S. Cl. 343—702 **13 Claims**

1. A radio frequency communications input/output subsystem for a personal computer, comprising:

an electrically insulating substrate having a surface lying in a geometric plane with a conductive layer thereon forming a ground plane;

a subsystem housing having a support for maintaining the substrate in a fixed position therewith, and including a mechanical connector assembly for mounting engagement with a mating connector on a personal computer housing;

an antenna mounted on said substrate and electrically insulated from said ground plane, with a principal axis of said antenna oriented substantially perpendicularly to said ground plane;

said personal computer housing imposing a disturbance to a radiated field from said antenna;

a radome mounted on said subsystem housing and surrounding said antenna, having an enhanced directivity oriented toward said personal computer housing, to compensate for said disturbance to said radiated field;

wherein said radome further comprises:

a substantially hemispherical shell having an open side mounted on said subsystem housing surrounding said antenna, with an edge forming a plane substantially parallel to said geometric plane, with one face of said shell proximate to said personal computer housing having a substantially planar surface substantially perpendicular to said geometric plane;

wherein said radome further comprises:

said one face of said shell proximate to said personal computer housing further including a cylindrical surface projecting therefrom having a cylindrical axis substantially perpendicular to said geometric plane;

wherein said antenna further comprises:

a top hat antenna having a mast portion oriented substantially perpendicularly to said geometric plane with one end thereof mounted on said substrate at a base point and electrically connected to a radio frequency signal source and the opposite end of said mast terminated at a conductive plate oriented substantially parallel to said geometric plane;

wherein said antenna further comprises:

said circular conductive plate having a radius of a first magnitude and said mast having a length of a second magnitude, the sum of said first and second magnitudes being substantially equal to a quarter wave length of electromagnetic radiation having a central resonant frequency value radiated by said antenna in response to said radio frequency signal source;

wherein said antenna further comprises:

a first transmission line mounted on said substrate and coupling said base point to said radio frequency signal source, forming a quarter wavelength matching transformer;

a second transmission line mounted on said substrate and connected to said base point, forming an impedance match at frequencies lower than said central frequency; and

a third transmission line mounted on said substrate and connected to said base point, forming an impedance match at frequencies higher than the central frequency.

5,815,121

FLATPLATE ARRAY ANTENNA WITH POLARIZER LENS

Donald C. Collier, Newtown, Conn., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation of Ser. No. 529,257, Sep. 15, 1995, abandoned. This application Apr. 11, 1997, Ser. No. 827,768

Int. Cl.[6] H01Q *15/24*

U.S. Cl. 343—756 **15 Claims**

1. An improved flatplate array antenna of the type comprised of an array for transmitting and receiving RF signals connected to at least one of a transmitter and a receiver wherein the improvement comprises a polarizer lens positioned adjacent the array and comprised of at least one dielectric sheet having an upper half and a

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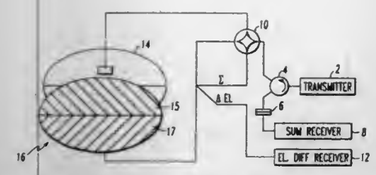


lower half, each half containing a set of parallel meanderlines positioned so that vertically or horizontally polarized RF energy emitted from the array passes through the lens and undergoes one of a phase advance and a phase retard so that the RF energy passing through the upper half becomes circularly polarized in one direction and the RF energy passing through the lower half becomes circularly polarized in an opposite direction thereby enabling the antenna to receive and process both senses of circular polarization simultaneously and to simultaneously emit both senses of circular polarization.

5,815,122

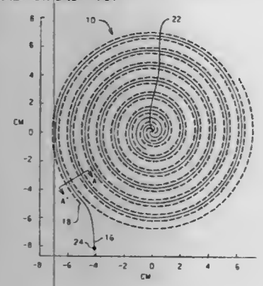
SLOT SPIRAL ANTENNA WITH INTEGRATED BALUN AND FEED

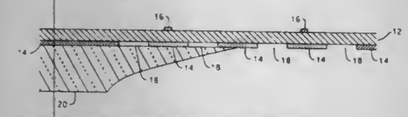
Michael W. Nurnberger, and John L. Volakis, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arobr, Mich.

Filed Jan. 11, 1996, Ser. No. 584,496

Int. Cl.[6] H01Q *13/10;1/36*

U.S. Cl. 343—767 **20 Claims**





1. A slot spiral antenna apparatus comprising:

a non-conductive substrate having first and second sides;

a conducting layer on said first side of said substrate, said conducting layer including at least one slotline having a slot arranged along a spiral curve;

a microstrip on said second side of said substrate, said microstrip configured to wind toward the center of said slotline and to provide a balanced feed to said slotline at a feed point to form a radiating element.

5,815,123

NRD GUIDE AND NRD GUIDE ELEMENT

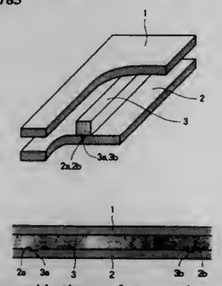
Hiroshi Uematsu, and Ken-Ichi Ogawa, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 484,176

Claims priority, application Japan, Aug. 25, 1994, 6-201144

Int. Cl.[6] H01Q *13/00;* **H01P** *3/16*

U.S. Cl. 343—785 **7 Claims**



2. A linear waveguide element for measuring transmission loss, said linear waveguide element comprising:

a linear dielectric strip fixedly disposed between a first parallel conductive plate and a second parallel conductive plate;

said linear dielectric strip having a first joint surface and a plurality of discrete raised protrusions formed on said first joint surface; and

said first parallel conductive plate having a second joint surface and a plurality of discrete recesses formed in said second joint surface, said recess in said second joint surface receiving and mating with said protrusions of said linear dielectric strip, with said first joint surface and said second joint surface being held in contact with each other.

5,815,124

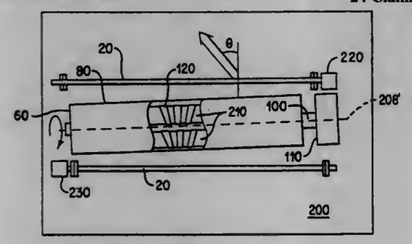
EVANESCENT COUPLING ANTENNA AND METHOD FOR USE THEREWITH

Vladimir A. Manasson; Lev S. Sadovnik, both of Los Angeles, and Paul I. Shnitser, Irvine, all of Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Continuation of Ser. No. 382,493, Feb. 1, 1995, Pat. No. 5,572,228. This application Jul. 30, 1996, Ser. No. 688,402

Int. Cl.[6] H01Q *13/00*

U.S. Cl. 343—785 **24 Claims**



1. A scanning antenna comprising:

a rotatable cylinder having an outer surface;

a continuously varying period conductive grating pattern of separated strips on said outer surface, said continuously varying period conductive grating pattern of separated strips defining a grating axis; and

a elongated dielectric waveguide defining a waveguide axis, said elongated dielectric waveguide being located proximally adjacent and alongside said continuously varying period conductive grating pattern of separated strips so as to evanescently couple electromagnetic signals with said elongated dielectric waveguide,

wherein a varying period of said continuously varying period conductive grating pattern of separated strips is a function of an angle defined by a position of said rotatable cylinder.

5,815,125

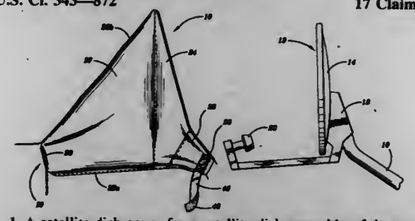
SATELLITE DISH COVER

David Z. Kelly, and Michael G. Ryan, both of Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 5, 1997, Ser. No. 795,492

Int. Cl.[6] H01Q *19/12*

U.S. Cl. 343—872 **17 Claims**



1. A satellite dish cover for a satellite dish assembly of the type comprising a support, a dish mounted on the support, and a feeder horn mounted on the support in a position where the feeder horn extends generally in front of the dish, said cover comprising:

a sheet of material constructed and arranged for being disposed over the dish and feeder horn of the satellite dish assembly, said sheet having a main body panel which wraps around the dish and feeder horn of the satellite dish assembly and a secondary body panel which extends from the dish to the support of the satellite dish assembly, said main body panel having an outer end portion for receiving the feeder horn therein; and

a cinching mechanism affixed to the end portion for cinching and tightening the main body panel about the dish and feeder horn of the satellite dish assembly.

5,815,126

MONOCULAR PORTABLE COMMUNICATION AND DISPLAY SYSTEM

John C. C. Fan, Chestnut Hill, Mass.; Jeffrey Jacobsen, Hollister, Calif.; Peter A. Ronzani, Los Gatos, Calif., and Stephen Pombo, Sunnyvale, Calif., assignors to Kopin Corporation, Taunton, Mass.

Continuation of Ser. No. 288,062, Aug. 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 220,042, Mar. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 141,133, Oct. 22, 1993, abandoned. This application May 21, 1996, Ser. No. 652,625

Int. Cl.[6] G09G *5/00*

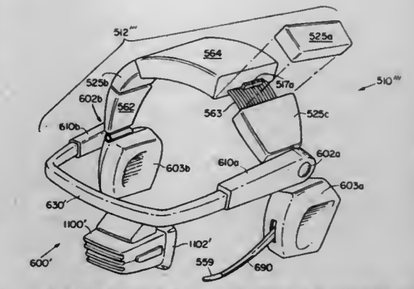
U.S. Cl. 345—8 **27 Claims**

1. A head-mounted monocular display system comprising:

a monocular display comprising a display housing, a liquid crystal matrix display mounted within the display housing, and an optical system mounted within the display housing to couple an image generated by the liquid crystal matrix display to a selected eye of a user;

a circuit housing securable to the head of the user, the circuit housing comprising display circuitry mounted therein that operates the liquid crystal matrix display to generate an image; and

a support track connected to the circuit housing, the monocular display being adjustably mounted to the support track relative to a selected eye of the user, the support track holding the display housing such that the monocular display housing can be moved relative to the support track and the circuit housing from a first position near one eye of the user to a second position near the other eye of the user while the circuit housing is secured to the head of the user.



5,815,127

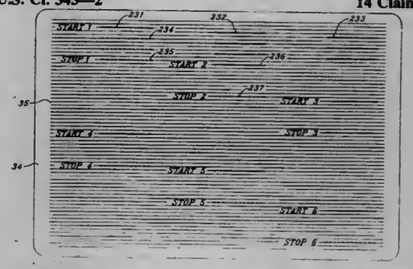
METHOD AND APPARATUS FOR DOWNLOADING INFORMATION FROM A CONTROLLABLE LIGHT SOURCE TO A PORTABLE INFORMATION DEVICE

Michael A. Jacobs, Naugatuck, and Mark A. Insero, Waterbury, both of Conn., assignors to Timex Corporation, Middlebury, Conn.

Continuation of Ser. No. 471,868, Jun. 5, 1995, Pat. No. 5,535,147, which is a continuation of Ser. No. 155,326, Nov. 22, 1993, Pat. No. 5,488,571. This application Jun. 24, 1996, Ser. No. 669,197

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—2 **14 Claims**



1. Method for increasing the baud rate of transmission from a screen scanning display having a raster sweeping successive scan lines, with a flyback interval between each scan line sweep by the raster, so as to activate successive pixels in a matrix, said apparatus adapted to transmit data to a portable information device adapted to receive asynchronously transmitted blocks of data comprising pulses of light at a predetermined pulse repetition rate, the method comprising:

causing successive bits within a block of data to commence at successive screen coordinate locations, each screen coordinate location being selected such that each successive bit commences on a different scan line and at a different temporal position along its respective scan line than the previous bit.

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5,815,128

GRAY SHADE DRIVING DEVICE OF LIQUID CRYSTAL DISPLAY

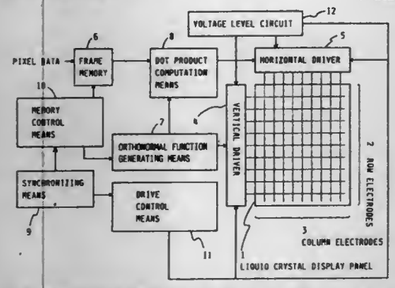
Masafumi Hoshino; Fujio Matsu, and Shuhei Yamamoto, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan

Filed Dec. 27, 1995, Ser. No. 579,250

Claims priority, application Japan, Dec. 27, 1994, 6-326108

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—89 **7 Claims**



1. A liquid crystal display panel gray shade driving device for driving, according to given pixel data composed of a plurality of bits, a liquid crystal display panel having pixels in a matrix by interposing a liquid crystal layer between a group of row electrodes and a group of column electrodes, the liquid crystal display tray shade driving device comprising:

first means for applying a plurality of row signals represented by a set of orthonormal functions to the group of row electrodes throughout one frame by set sequential scanning for each of selecting periods, the first means having orthonormal function generating means for forming the plurality of row signals and vertical driving means for doubling the rate of the row signal applied to the group of row electrodes and repeating the same set sequential scanning at least for two frames of previous and subsequent frames; and

second means for sequentially carrying out a dot product computation between the set of orthonormal functions and a set of pixel data, and applying a column signal having a voltage level corresponding to a result of the computation to the group of column electrodes in synchronization with the set sequential scanning for each of the selecting periods, the second means having a frame memory for holding the pixel data in each frame while dividing it according to a significance of each bit, dot product computing means for reading out the set of held pixel data per significance of each bit and carrying out the dot product computation to generate a column signal component corresponding to the significance of each bit, and horizontal driving means for dividing the column signal components into a significant bit component and a less significant bit component, distributing one of the bit components to the previous frame and distributing the other of the bit components to the subsequent frame to generate a column signal for application to the group of column electrodes.

5,815,129

LIQUID CRYSTAL DISPLAY DEVICES HAVING REDUNDANT GATE LINE DRIVER CIRCUITS THEREIN WHICH CAN BE SELECTIVELY DISABLED

Byung-hoo Jung, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Nov. 27, 1996, Ser. No. 758,649

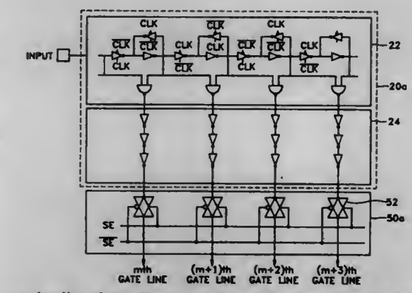
Claims priority, application Rep. of Korea, Dec. 1, 1995, 1995/46034; Dec. 30, 1995, 1995/69702

Int. Cl.[6] G09G *3/18*

U.S. Cl. 345—93 **12 Claims**

1. A liquid crystal display device, comprising:

a plurality of rows of display cells;



a plurality of gate lines, each of said gate lines connected to a respective row of display cells in the plurality thereof;

means for driving first and second ends of each of said plurality of gate lines with respective gate line driving signals; and

a first switch array, electrically coupled between first ends of said plurality of gate lines and said driving means, which disables transfer of the gate line driving signals from said driving means to the first ends of said plurality of gate lines in response to a first switch disable signal.

5,815,130

CHIRAL SMECTIC LIQUID CRYSTAL DISPLAY AND METHOD OF SELECTIVELY DRIVING THE SCANNING AND DATA ELECTRODES

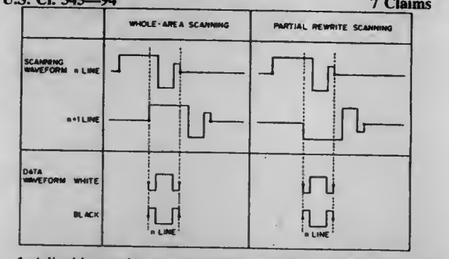
Osamu Taniguchi, Chigasaki; Akira Tsuboyama, Sagamihara; Yutaka Inaba, Kawaguchi; Kazunori Katakura, Atsugi; Tadashi Mihara, Isehara; Mitsuo Iwayama, Odawara, and Yoshio Hotta, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 113,806, Aug. 31, 1993, abandoned, which is a division of Ser. No. 814,436, Dec. 30, 1991, Pat. No. 5,267,065, which is a continuation-in-part of Ser. No. 790,078, Nov. 13, 1991, abandoned, which is a continuation of Ser. No. 512,259, Apr. 20, 1990, abandoned. This application Jun. 1, 1995, Ser. No. 456,725

Claims priority, application Japan, Apr. 24, 1989, 1-101733; Jun. 18, 1991, 3-145996

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—94 **7 Claims**



1. A liquid crystal apparatus, comprising: a chiral smectic liquid crystal device having a group of scanning electrodes arranged in a matrix with and spaced apart from a group of signal electrodes with a chiral smectic liquid crystal disposed therebetween so as to provide a picture element at each intersection of the scanning electrodes and the signal electrodes, and signal application means for applying information signals to the signal electrodes in phase with scanning signals selectively applied to the scanning electrodes, said signal application means being arranged:

(a) to apply a preceding scanning selection signal comprising a former voltage of one polarity and a latter voltage of the other polarity to a particular one of the scanning electrodes to select that particular scanning electrode and, in synchronism with the scanning selection signal applied to select the particular scanning electrode, to apply data signals to the signal electrodes so that the pixels on the particular scanning electrode supplied with the former voltage of one polarity are non-selectively erased into one display state and the pixels on the particular scanning electrode supplied with the latter voltage of the other polarity are respectively selected in display states depending on the information signals applied in synchronism with the latter voltages of the other polarity, and

(b) to apply a subsequent scanning selection signal comprising a former voltage of said the other polarity and a latter voltage of said one polarity to a scanning electrode selected subsequent to said particular scanning electrode to select the subsequently selected scanning electrode, so that the former voltage of said the other polarity of the subsequent scanning selection signal is applied during the period of applying the data signals for selecting the display states of the pixels on said particular scanning electrode;

wherein said former voltage of said preceding scanning selection signal and said former voltage of said subsequent scanning selection signal are of mutually opposite polarities, and said latter voltage of said preceding scanning selection signal and said latter voltage of said subsequent scanning selection signal are of mutually opposite polarities,

the voltage polarities being determined with respect to the voltage level of a scanning electrode to which the scanning selection signal is not applied, and

wherein said former voltage of the preceding scanning selection signal and said former voltage of the subsequent scanning selection signal overlap each other for a period of time.

5,815,131

LIQUID CRYSTAL APPARATUS

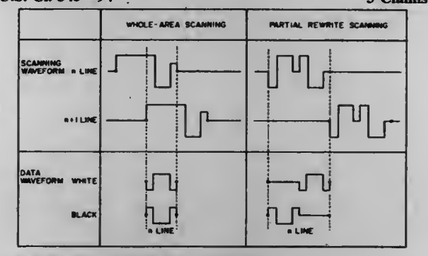
Osamu Taniguchi, Chigasaki; Akira Tsuboyama, Sagamihara; Yutaka Inaba, Kawaguchi; Kazunori Katakura, Atsugi; Tadashi Mihara, Isehara; Mitsuo Iwayama, Odawara, and Yoshio Hotta, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 465,193, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 113,806, Aug. 31, 1993, abandoned, which is a division of Ser. No. 814,436, Dec. 30, 1991, Pat. No. 5,267,065, which is a continuation-in-part of Ser. No. 790,078, Nov. 13, 1991, abandoned, which is a continuation of Ser. No. 512,259, Apr. 20, 1990, abandoned. This application Sep. 4, 1997, Ser. No. 923,464

Claims priority, application Japan, Apr. 24, 1989, 1-101733; Jun. 18, 1991, 3-145996

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—94 **3 Claims**



1. A liquid crystal apparatus, comprising:

(a) a display panel having a matrix formed by a plurality of scanning lines and a plurality of data lines and a liquid crystal having a memory function;

(b) drive means for sequentially applying a scanning selection signal to the scanning lines and applying data signals to the data lines in synchronism with the scanning selection signal; and

(c) control means for:

selecting either a first operation of scanning all the scanning lines with the scanning selection signal in response to a whole-area rewrite demand or a second operation of scanning a subset of the scanning lines with the scanning selection signal in response to a partial rewrite demand, and

controlling the drive means so that, in the first operation, two scanning selection signals overlapping in time are successively applied to two scanning lines respectively and, in the second operation, two scanning selection signals not overlapping in time are successively applied to two scanning lines respectively.

5,815,132

LIQUID CRYSTAL DISPLAY APPARATUS

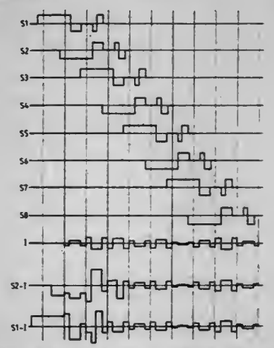
Shinjiro Okada, Isehara; Yutaka Inaba, Kawaguchi, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 376,375, Jan. 23, 1995, Pat. No. 5,519,411, which is a continuation of Ser. No. 984,694, Dec. 2, 1992, abandoned. This application Jan. 25, 1996, Ser. No. 591,085

Claims priority, application Japan, Dec. 4, 1991, 3-320542

Int. Cl.[6] G09G *3/18*

U.S. Cl. 345—95 **8 Claims**



1. A method for driving a liquid crystalline cell provided with a first substrate having a plurality of scanning electrodes, a second substrate having an information electrode, and a liquid crystal sandwiched between the first and second substrates, said method comprising the steps of:

supplying an n-th scanning electrode with a first erasing signal, a first scanning signal and a second scanning signal;

supplying an n+1-th scanning electrode with a second erasing signal, a third scanning signal and a fourth scanning signal, the third scanning signal being synchronized with the second scanning signal; and

supplying the information electrode with an information signal for determining a displaying state of a pixel on the n+1-th scanning electrode according to display information, synchronized with the third scanning signal,

wherein the third scanning signal and the second scanning signal have, respectively, different voltages and/or pulse widths, so that an area of an inverted region formed within a first pixel on the nth scanning electrode by a voltage waveform synthesized from the second scanning signal and the information signal is smaller than an area of an inversion region formed within a second pixel on the n+1-th scanning electrode by a voltage waveform synthesized from the third scanning signal and the information signal,

wherein the first erasing signal and the second erasing signal have different polarities and the same waveform shape, the first scanning signal and the third scanning signal have different polarities and the same waveform shape, and the second scanning signal and the fourth scanning signal have different polarities and the same waveform shape, and

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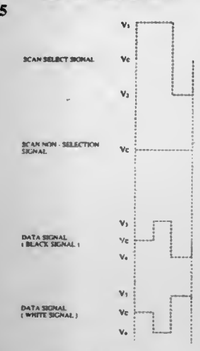
wherein information for one pixel is displayed over the n-th scanning electrode and the n+1-th scanning electrode.

5,815,133
DISPLAY APPARATUS

Akira Tsuboyama; Hiroyuki Yokomizo, both of Atsugi; Mitsuo Iwayama, Odawara, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,022, Nov. 15, 1993, abandoned. This application Sep. 18, 1996, Ser. No. 715,137
Claims priority, application Japan, Nov. 17, 1992, 4-331065; Dec. 10, 1992, 4-352175; Dec. 18, 1992, 4-354847
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—95 **24 Claims**



1. A display apparatus comprising:

a display panel having a matrix electrode structure in which pixel regions are formed by intersection portions of scan electrodes and data electrodes and non-pixel regions are formed by non-intersection portions;

drive means for applying scan signals to the scan electrodes and applying data signals to the data electrodes in synchronization with the scan signals;

drive voltage generating means for supplying drive voltage to said drive means;

a power supply source for supplying power to said drive voltage generating means;

switching means for switching ON/OFF the electrical connection between said drive voltage generating means and said power supply source;

detection means for detecting whether or not said switching means has been switched on and generating a detection signal in response to the detection; and

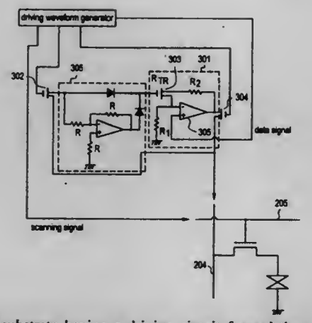
control means for, in response to receipt of the detection signal, controlling said drive means so as to apply a constant voltage V_c to the scan electrodes and apply, to the data electrodes, a signal voltage of a level sufficiently high to cause the non-pixel regions to achieve a uniform optical state, at a period for interrupting a writing operation of the pixel regions by said drive means and after said writing operation.

5,815,134
LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE AND DRIVING METHOD THEREOF

Takeshi Nishi, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed May 8, 1995, Ser. No. 436,864
Claims priority, application Japan, May 16, 1994, 6-126804
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—97 **21 Claims**

1. A liquid crystal electro-optical device comprising:



a first substrate having a driving circuit formed thereon and a plurality of pixel electrodes formed thereon in a matrix form, said pixel electrodes being provided with thin-film transistors connected thereto;

a second substrate opposed to the first substrate and provided with an opposed electrode;

a ferroelectric or antiferroelectric liquid crystal material provided between the first and second substrates,

a voltage applying circuit for applying a first voltage through one of the thin film transistors to the crystal material between the respective pixel electrodes and the opposed electrode; and

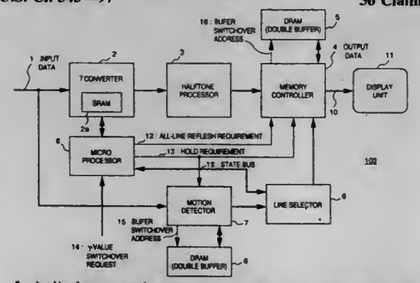
a voltage detecting circuit for detecting said first voltage, said voltage detecting circuit feeding said first voltage back to said voltage applying circuit,

wherein said voltage detecting circuit comprises at least an operational amplifier and a transistor.

5,815,135
DISPLAY CONTROL APPARATUS

Hideaki Yui, Kawasaki, and Katsuhiro Miyamoto, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1996, Ser. No. 625,069
Claims priority, application Japan, Apr. 5, 1995, 7-080412
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—97 **36 Claims**



1. A display control apparatus which inputs frame-unit image data and performs display control, comprising:

conversion means for performing a predetermined conversion processing on the input image data to obtain converted data;

detection means for detecting a change between frames of the input image data;

first output means for outputting data to partially update display based on the change detected by said detection means and the converted data obtained by said conversion means;

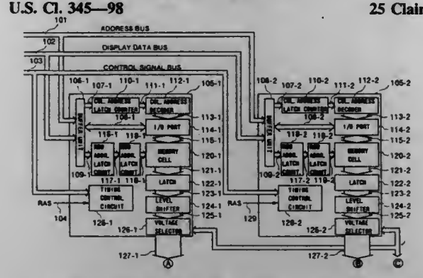
switching means for switching the conversion processing of said conversion means; and

second output means for, if said switching means switches the conversion processing of said conversion means, outputting data consisting of converted data obtained from conversion processing switched by said switching means, for at least one frame.

5,815,136
LIQUID CRYSTAL DISPLAY WITH LIQUID CRYSTAL DRIVER HAVING DISPLAY MEMORY

Makiko Ikeda; Tsutomu Furuhashi, both of Yokohama; Hiroyuki Nitta, Fujisawa; Isao Takita, Fujisawa; Naruhiko Kasai, Fujisawa; Satoru Tsunekawa, Higashimurayama, and Tatsuhiro Inuzuka, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 297,058
Claims priority, application Japan, Aug. 30, 1993, 5-213733; Dec. 20, 1993, 5-320074
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—98 **25 Claims**



1. A liquid crystal display with a liquid crystal panel having a plurality of data lines and a plurality of scanning lines arranged in a matrix form with pixels being formed at intersections of the data and scanning lines, a scanning circuit for successively applying a voltage to said plurality of scanning lines, and a liquid crystal driver for receiving display data from an external device to apply a voltage corresponding to said display data to said plurality of data lines so as to display an image on the liquid crystal panel,

wherein said scanning circuit includes a synchronizing signal generating circuit for generating a frame display synchronizing signal indicative of a frame period for display of image on said liquid crystal panel and a line display synchronizing signal indicative of a line period for image display on said liquid crystal panel, and

wherein said liquid crystal driver includes:

memory means having memory elements for storing image data having data volume corresponding to a number of pixels driven by a number of the data lines as same as a number of output terminals of said liquid crystal driver;

a data bus having a plurality of data lines for transferring display data to be written into said memory means from said external device to said memory means whereupon said display data is written into said memory means for subsequent display on said liquid crystal panel, and for transferring display data read out from said memory means by said external device from said memory means to said external device;

a plurality of output lines having a number of output lines more than the number of output terminals of said liquid crystal driver for transferring the display data stored in said memory means;

access control means, wherein in display operation on said liquid crystal panel a number of display data are read out from said memory means at one time for a number of pixels in a horizontal line corresponding to a number of data lines same as the number of output terminals of said liquid crystal driver, and while in write/read operation of the display data to said memory means from said external device write/read operation of the display data are made with converting addresses of the data to corresponding addresses in the memory means;

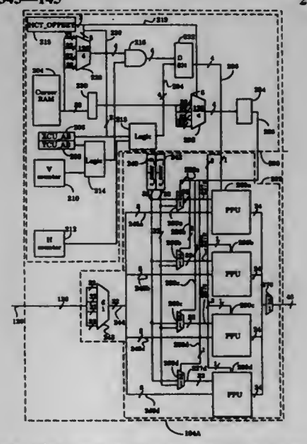
holding means including a pre-stage holding circuit and a post-stage holding circuit, wherein said pre-stage holding circuit holds a number of display data more than the number of output terminals of said liquid crystal driver at one time read out from said memory means at one time at each horizontal line period and transferred via said output lines, and said post-stage holding circuit holds the display data held in said pre-stage holding circuit at one time at predetermined timing of at each horizontal line period; and

a voltage output circuit for outputting a number of the display data more than the number of output terminals of said liquid crystal driver held by said holding means after conversion thereof into a voltage to be applied to the liquid crystal of the pixel of said liquid crystal panel.

5,815,137
HIGH SPEED DISPLAY SYSTEM HAVING CURSOR MULTIPLEXING SCHEME

Jim Weatherford; Brad W. Hoffert, both of Mountain View; Robert Stano, Sunnyvale; Shawn Storm, Menlo Park, and Andreas Bechtolsheim, Mountain View, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 19, 1994, Ser. No. 326,311
Int. Cl.[6] G09G *5/08*
U.S. Cl. 345—145 **20 Claims**



1. A method for generating display control data comprising the steps of:

a) receiving display data of a multi-pixel section having at least two pixels of a display frame;

b) receiving cursor data of a cursor in single pixel increments;

c) determining if a portion of said cursor intersects one or more pixels of said multi-pixel section; and

d)(1) if said portion of said cursor intersects one or more pixels of said multi-pixel section, simultaneously processing (i) said cursor data and said display data for said one or more pixels in said multi-pixel section and (ii) said display data for a remainder of said pixels in said multi-pixel section, if any, that do not intersect said cursor for display on said display frame,

d)(2) otherwise, simultaneously processing said display data for each pixel in said multi-pixel section for display on said display frame.

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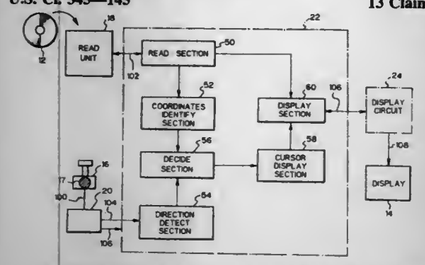
5,815,138
METHOD AND APPARATUS FOR CONTROLLING A CURSOR

Hisayoshi Tsubaki, and Norihisa Haneda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 134,690, Oct. 12, 1993, abandoned.
This application Jul. 6, 1995, Ser. No. 499,075
Claims priority, application Japan, Oct. 16, 1992, 4-278574
Int. Cl.[6] G09G *5/08*
U.S. Cl. 345—145 **13 Claims**



1. A cursor control apparatus for reading data out of a data recording medium, displaying an image represented by said data on a display, and generating image data in response to an output signal of inputting means representative of an operator's manipulation of said inputting means, said apparatus comprising:

control means for generating first image data representative of a plurality of selectable areas and second image data representative of a cursor; and

displaying means for causing said first and second image data generated by said control means to be visualized on said display;

said control means including.

reading means for reading the data recorded in said data recording medium,

coordinates identifying means for identifying first coordinates representative of positions of the selectable areas on the basis of the data read by said reading means,

direction detecting means for detecting, in response to the output signal of said inputting means, a direction in which said inputting means is manipulated and outputting direction data representative of the direction detected,

deciding means for determining the first coordinates representative of a selectable area which is located in the direction detected and closest to the position of said cursor by using only said direction data received from said direction detecting means, the first coordinate data and second coordinate data representative of a position of said cursor, and for updating the second coordinates by replacing said second coordinates with determined first coordinates to produce third coordinates representative of an updated position of said cursor, said updating of the second coordinates being performed independent of a degree of manipulation of said inputting means, and

cursor displaying means for generating the second image data representative of said cursor on the basis of said third coordinates received from said deciding means.

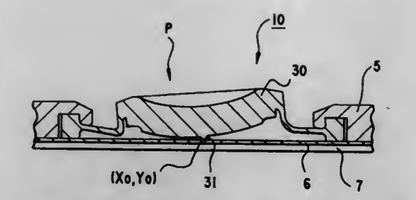
5,815,139
RELATIVE MANIPULATED VARIABLE INPUT DEVICE

Osamu Yoshikawa, and Takayuki Mizuki, both of Tokyo, Japan, assignors to SMK Corporation, Tokyo, Japan

Filed Apr. 29, 1997, Ser. No. 848,669
Claims priority, application Japan, May 1, 1996, 8-132570
Int. Cl.[6] G09G *5/08*
U.S. Cl. 345—157 **2 Claims**

1. A relative manipulated variable input device comprising:

a tablet sheet formed by a pair of opposed tablet film sheets and disposed in parallel with a very small gap defined therebetween;



a control button disposed above said tablet sheet so that, when tilted in a desired direction while being depressed, said control button presses said tablet sheet continuously at different positions;

position detecting means for detecting, as a pressed position, a position of contact between said pair of tablet film sheets by depression of said control button;

contact resistance detecting means for detecting a contact resistance value at said pressed position; and

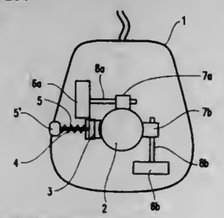
reference position setting means for storing a first pressed position of said tablet sheet as a reference position at least until a force applied to said control button is removed,

wherein output data, representing a direction and an amount of tilt of said control button when said button is depressed, is generated using said contact resistance value and relative position data calculated from a difference between said pressed position and said reference position.

5,815,140
MOUSE WITH A MOVABLE CLEANING MEMBER

Yukio Kitazawa, Gunma, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1995, Ser. No. 563,000
Claims priority, application Japan, Nov. 28, 1994, 6-292834
Int. Cl.[6] G09G *3/02*
U.S. Cl. 345—164 **20 Claims**



1. A pointing device comprising:

a housing having a hole;

a ball within said housing, part of said ball protruding from said hole of said housing;

a cleaning member within said housing; and

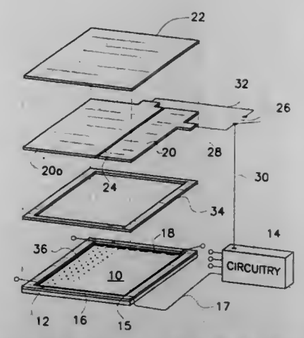
means within said housing for pressing said cleaning member against said ball only when said ball needs cleaning.

5,815,141
RESISTIVE TOUCHSCREEN HAVING MULTIPLE SELECTABLE REGIONS FOR PRESSURE DISCRIMINATION

Robert Phares, Knoxville, Tenn., assignor to Elo Touch Systems, Inc., Fremont, Calif.

Filed Apr. 12, 1996, Ser. No. 631,065
Int. Cl.[6] G09G *3/02;* **G08C** *21/00*
U.S. Cl. 345—173 **20 Claims**

1. A resistive position touchscreen for providing information as to a point of touch by an object, and selectively discriminating against contact of other objects, said resistive position touchscreen comprising:



first and second closely spaced and separated sheets, said first and second sheets contacting each other at a point when touched by an object at that point, at least one of said first and second sheets divided into a plurality of electrically separated regions;

a resistive layer applied to at least one of said first and second sheets on a surface facing another of said first and second sheets, said resistive layer having a selected substantially uniform resistivity throughout said resistive layer;

field generating means connected to opposite edges of said resistive layer for producing electrical fields in said resistive layer;

a circuit means for applying voltages in proper timed sequence to said field generating means, and for receiving and analyzing signals from said plurality of separated regions to ascertain information as to a point of touch; and

a switch means connected to each of said separated regions to selectively connect at least one of said separated regions with said circuit means whereby a selected portion of said resistive layer is active for providing information as to the position of touch of the object.

5,815,142
APPARATUS AND METHOD FOR MARKING TEXT ON A DISPLAY SCREEN IN A PERSONAL COMMUNICATIONS DEVICE

David Joseph Allard, Boynton Beach; James Robert Lewis, Coconut Creek; Debra Ann Gawne Johnson, Fort Lauderdale; Francis James Canova, Jr., Boynton Beach; Charles Sterling Lanier, Delray Beach; William Villafana, Davie; Byron Kevin Tiller, Boca Raton; Raymond Lee Yee, Coral Springs; Julie Francis Goodwin; Jean Luter Stout, both of Boca Raton; Peter Rowland Eastwood, Delray Beach; Daniel Ming-Te Hsieh, and Connie Yudip Au, both of Coral Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

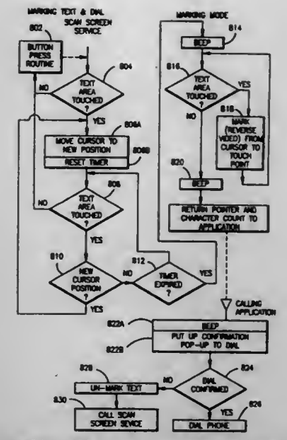
Continuation of Ser. No. 279,639, Jul. 25, 1994, abandoned.
This application Dec. 21, 1995, Ser. No. 576,834
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—173 **1 Claim**

1. A method of marking information displayed on a touch sensitive display screen of a computer system, comprising the steps of:

(a) touching said screen at a first location to establish a first position for a cursor displayed on said screen, the movement of said cursor being responsive to the movement of the touch on said screen;

(b) initiating a mark mode whereby marking of information on said screen can begin by continuing touching said screen at said first location to maintain said cursor at said first position for a predetermined time;

(c) movingly touching said screen away from said first location to move said cursor to mark desired information being displayed on said screen; and



(d) stop touching said screen to terminate said mark mode;

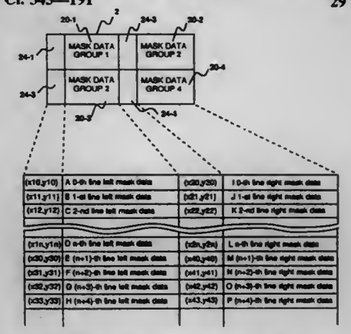
wherein said computer system further comprises a communications interface means, and wherein after termination of said mark mode the method further comprising the step of:

touching another portion of said screen to confirm that the marked information is correct so that said marked information is used to initiate a call to a call number.

5,815,143
VIDEO PICTURE DISPLAY DEVICE AND METHOD FOR CONTROLLING VIDEO PICTURE DISPLAY

Warren Kimberly Jenney; Randy Minobe, both of San Jose, Calif.; Tomohisa Koyiyama, Kanagawa-ken, Japan; Masami Yamagishi, Kanagawa-ken, Japan; Takahiro Yamada, Kanagawa-ken, Japan; Munekazu Kamo, Kanagawa-ken, Japan; Makoto Noumi, Ibaragi, Japan, and Noriyuki Iwai, Kanagawa-ken, Japan, assignors to Hitachi Computer Products (America), Santa Clara, Calif.

Continuation of Ser. No. 136,327, Oct. 13, 1993, abandoned.
This application Apr. 17, 1996, Ser. No. 634,117
Int. Cl.[6] G09G *5/36*
U.S. Cl. 345—191 **29 Claims**



1. The write mask control system for Video data capture system or display system comprising:

control memory containing the following data as a control data block for at least each scan line:

write start address,

write mask data;

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and a controller which reads the control data block from the control memory, comprising:

a write address generator which generates a write address from the initial said write start address, and a write control means that controls the video data to either write or not write according to said write mask data.

5,815,144

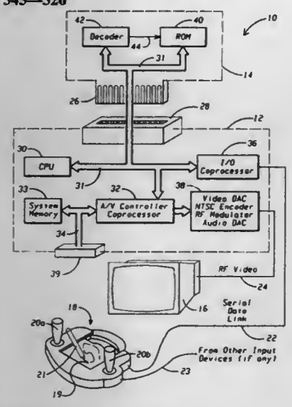
ICON-BASED RESET FOR CARTRIDGE MEMORY COMPUTER SYSTEM

James Alan Strothmann, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 474,408

Int. Cl.[6] G06F *3/00*

U.S. Cl. 345—326 **13 Claims**



1. A computer system comprising:

(a) a central processing unit (CPU);

(b) a removable memory circuit having an application program, said removable memory circuit in circuit communication with said CPU;

(c) a video circuit in circuit communication with said CPU and said memory for generating an electrical signal corresponding to a visual image to be displayed on a video display device;

(d) an I/O coprocessor in circuit communication with said CPU and comprising logic for determining when a removable memory circuit has been removed from the computer system and a new removable memory circuit has been inserted into the computer system;

(e) a system manager interface for controlling said computer system operation wherein said system manager interface comprises:

(1) logic for generating and displaying a system management menu upon the determination that a removable memory circuit has been removed and a new removable memory circuit has been inserted into the computer system;

(2) logic for generating and displaying the system management menu upon selection of a system management icon on said visual display device; and

(3) logic for sending a reset command from said CPU to said I/O coprocessor upon selection of a reset menu option in said system management menu to thereby reset said computer system.

5,815,145

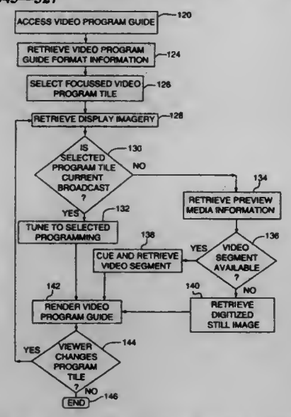
SYSTEM AND METHOD FOR DISPLAYING A PROGRAM GUIDE FOR AN INTERACTIVE TELEVIDEO SYSTEM

Joseph H. Matthews, III, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Aug. 21, 1995, Ser. No. 517,255

Int. Cl.[6] H04N *7/14;5/45*

U.S. Cl. 345—327 **16 Claims**



1. In an interactive televideo system having a central control node in bidirectional communication with plural viewer stations that include video display sets operably coupled to interactive station controllers, the central control node delivering programming over multiple channels to the plural viewer stations and receiving information from the interactive station controllers, selected programming being delivered according to a programming schedule, a method of providing a selected viewer station with programming information for selected channels and a selected programming schedule period, comprising:

obtaining first and second programming images corresponding to programming available on respective first and second selected channels during the selected programming schedule period, the first programming image including a video segment relating to programming available on a first one of the selected channels and the second programming image including a single frame image relating to programming available on a second one of the selected channels, the first programming image being obtained by accessing a video segment relating to the programming available on the first one of the selected channels, the video segment being stored at the central control node; and

rendering simultaneously the first and second programming images on the video display set of the selected viewer station.

5,815,146

VIDEO ON DEMAND SYSTEM WITH MULTIPLE DATA SOURCES CONFIGURED TO PROVIDE VCR-LIKE SERVICES

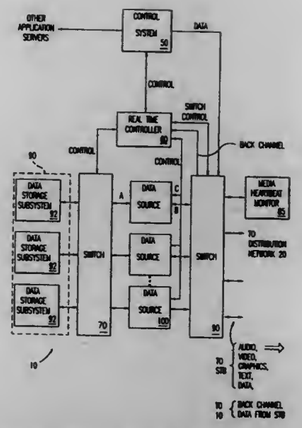
John J. Youden, Cupertino; Albert W. Kovalick, Santa Clara; Paolo L. Siccardo, Los Altos; Christopher R. Adams, Menlo Park; James E. Jensen, San Jose; David John Coggins, Cupertino; Manu Thapar, Fremont, all of Calif., and Kari Santos, Boulder, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 269,796, Jun. 30, 1994, Pat. No. 5,606,359. This application Sep. 16, 1996, Ser. No. 715,272

Int. Cl.[6] H04N *7/14*

U.S. Cl. 345—327 **5 Claims**

1. A system for providing at least video data to a plurality of users, the system comprising:



a data storage system for storing at least video data;

a plurality of data sources coupled to the data storage system, each data source receiving several independent streams of video data from the data storage system and directing the independent streams to a plurality of users under the direction of a first controller;

a first switch coupled to each of the data sources and to a plurality of communications channels, the first switch directing the packaged video data from a data source to a communications channel;

the first controller coupled to the first switch, the data sources, and the data storage system, the first controller controlling the connection of the data storage system to the data sources, the data sources to the first switch, and the first switch to the communications channel, the first controller making the connections at least partially in response to user requests received from users over the communications channel; and

a second controller coupled to the first controller, the second controller controlling system access by users.

5,815,147

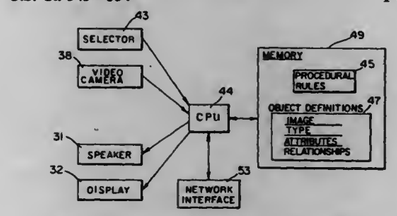
VIRTUAL PLAY ENVIRONMENT FOR DISABLED CHILDREN

Daniel K. Bogen, Swarthmore, and Kirk A. Reinbold, Phoenixville, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Jun. 7, 1996, Ser. No. 659,996

Int. Cl.[6] G06F *15/00*

U.S. Cl. 345—334 **1 Claim**



1. A system for providing a virtual play environment, comprising:

a central processing unit;

a selection device connected with the central processing unit;

a computer memory connected with the central processing unit for storing object definitions and operational rules, each object definition including a plurality of attributes, including:

an encoded visual image of a physical object;

a binding variable for indicating whether the object is bindable to a second object;

a moveability variable for indicating whether the object is moveable within the play environment;

a selectability variable for indicating whether the object is selectable for an activity; and

instructions defining an action procedure to be followed by the central processing unit when the object is selected; and

the operational rules defining a sequence of steps to be performed by the central processing unit to effect actions of defined objects in response to the selection device; and

a visual display device connected with the central processing unit for displaying a visual image of a defined object and the actions of the defined object when the defined object is selected by the user.

5,815,148

MULTI-MEDIA DATA COMMUNICATION SYSTEM HAVING A PLURALITY OF TYPES OF GRAPHICAL USER INTERFACES

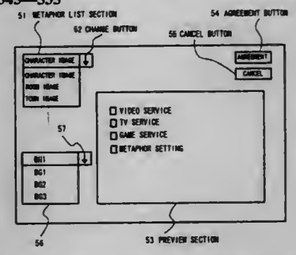
Mitsumasa Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 16, 1995, Ser. No. 558,647

Claims priority, application Japan, Nov. 21, 1994, 6-311199

Int. Cl.[6] G06F *3/14*

U.S. Cl. 345—335 **20 Claims**



1. A multi-media data communication system comprising:

a server having a plurality of graphic user interface (GUI) structures which are different in metaphor image from each other but function to provide the same service, for transmitting a specific one of said plurality of GUI structures in response to an inputted service request including an identifier data for designating one GUI structure, and for providing a specific service designated based on said transmitted GUI structure; and

a plurality of terminal equipments that are connected to said server via a bidirectional communication line and each of which is capable of issuing the service request, wherein a request issuing terminal equipment of said plurality of terminal equipments issues the service request including the identifier data to said server via said bidirectional communication line, receives said GUI structure transmitted from said server to establish a GUI, designates said specific service using the established GUI, and receives said specific service from said server,

wherein one of the plurality of graphic user interface structures which are different in metaphor image from each other but function to provide the same service is selectable by a user of one of said plurality of terminal equipments by the user making a selection on a display screen provided on said one of said plurality of terminal equipments in response to a metaphor change request outputted from said one of said plurality of terminal equipments.

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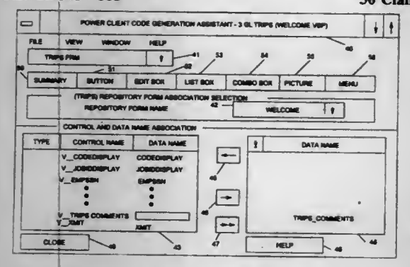
5,815,149
METHOD FOR GENERATING CODE FOR MODIFYING EXISTING EVENT ROUTINES FOR CONTROLS ON A FORM

Eugene Otto Mutschler, III; Joseph Peter Stefaniak, both of San Clemente, and Bao Quoc Vu, Mission Viejo, all of Calif., assignors to Unisys Corp., Blue Bell, Pa.

Filed Feb. 19, 1997, Ser. No. 803,137
Int. Cl.[6] G06F *7/00*
U.S. Cl. 345—335 **30 Claims**



1. In a computing system having at least one server and a multiplicity of clients coupled thereto by means of a network, said server having a CPU executing legacy programs and at least one storage device coupled thereto, said storage device being disposed for storing forms of said legacy program, a method operating in at least one of said clients for generating code for modifying existing event routines for controls on said forms, said method comprising the steps of:

a. displaying on a screen of said at least one client a list of available applications;

b. in response to a user's selection of an application, obtaining and displaying a list of application forms stored in said storage device;

c. in response to a user's selection of a drive and a directory, displaying a list of client builder projects;

d. in response to a user's selection of a specific client builder project, parsing application portion of said specific client builder project to obtain a list of client builder forms therefrom;

e. displaying a list of client builder forms in said specific client builder project;

f. in response a user's selection of one of said list of client builder forms, parsing said selected client builder form;

g. storing client builder control and event routine information obtained in the parsing of step f hereof;

h. determining from the parsing of step f hereof that said selected client builder form does not contain a table associating controls of said selected client builder form and data fields of any application form;

i. in response to a user's selection of one of said list of application forms, associating said application form with said selected client builder form;

j. displaying a first list of controls on said selected client builder form as found by the parsing in step f hereof, displaying a second list, which is empty and will contain data names from said associated application form, that will be associated with members of said first list and displaying a third list of data names from said associated application form to be assigned to said second list;

k. establishing and removing links between controls on said selected client builder form and data names from said associated application form as items are moved by a user from said second and said third lists in accordance with step j hereof;

l. accepting and storing changes and additions for controls of said selected client builder form associated with data names of said associated application form;

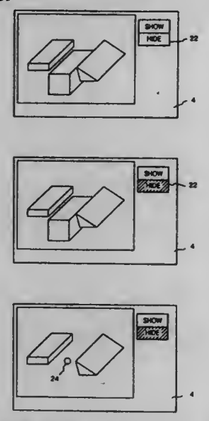
m. generating a new client builder program based on information stored in steps g and l hereof and on said links established in step k hereof and marking parts of said new client builder program added as a result of the execution of steps k and l hereof; and,

n. inserting a table in said new client builder program generated in the preceding step containing information necessary to determine in a future parse of said new client builder program the association between the controls of said selected client builder form and said associated application form.

5,815,150
DISPLAY APPARATUS

Kazuma Shimizu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 287,855, Aug. 9, 1994. This application Aug. 8, 1996, Ser. No. 695,668
Claims priority, application Japan, Aug. 25, 1993, 5-210581
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—339 **19 Claims**



11. A display apparatus used in a CAD system for designing a work of a plurality of members, comprising:

display means for simultaneously displaying figures representing two and/or three dimensional shapes of respective ones of the plurality of members, wherein a shape figure of any member is displayed as elements of the work to be designed in the CAD system is capable of being hidden from view;

mode setting means for setting the display apparatus to a mode in which the shape of a hidden member is caused to be re-displayed;

designating means for allowing an operator to designate any position on a screen of the display means;

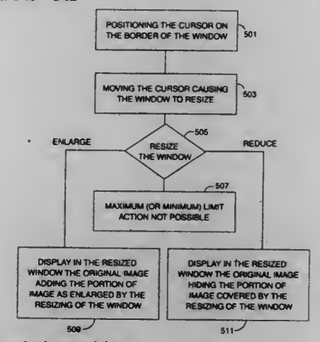
searching means for searching for a hidden member over a prescribed range based upon the position designated by the operator using said designating means; and

control means for controlling the display means to display a shape figure of a hidden member situated in the vicinity of the position designated by the operator using said designating means.

5,815,151
GRAPHICAL USER INTERFACE

Andrea Argiolas, Cagliari, Italy, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 2, 1997, Ser. No. 778,318
Claims priority, application United Kingdom, Mar. 8, 1996, 9605007
Int. Cl.[6] G06F *3/00*
U.S. Cl. 345—342 **2 Claims**



1. A method comprising:

displaying graphical information in a client area of a window defined in a position within a computer driven display, the window being bounded by a border;

displaying a cursor on the computer driven display, the position of the cursor being controlled by manipulation of a pointing device;

keeping the graphical information displayed in the client area stable in its original position within the computer driven display and anchoring the graphical information to a corner of the client area;

associating the cursor with a point on the border of the window opposite to the anchor corner; and

manipulating the pointing device to move the portions of the border which intersect the point to change the size of the client area while retaining the stabilized graphical information display anchored to the corner of the client area position notwithstanding changes in the size thereof;

whereby portions of the graphical information toward the moved side of the client area are shown or hidden from view in the client area as the size thereof changes.

5,815,152
METHOD AND APPARATUS FOR DEFINING AND EVALUATING A GRAPHIC RULE

Mary F. Collier, and Michael K. Bennett, both of Columbia, Md., assignors to Logical Software Solutions Corporation, Greenbelt, Md.

Continuation of Ser. No. 423,759, Apr. 18, 1995, abandoned. This application Jun. 19, 1997, Ser. No. 879,087
Int. Cl.[6] G06F *15/20*
U.S. Cl. 395—348 **12 Claims**

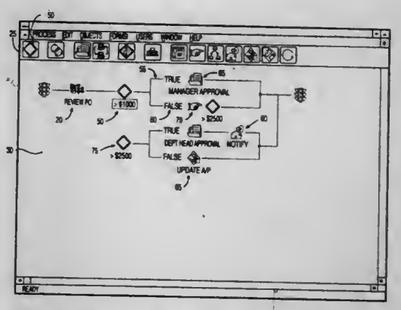
1. A method of defining a rule to be evaluated by a system comprising the steps of:

graphically selecting a condition to be associated with a rule, the condition evaluating to at least two values;

graphically displaying the condition on a display;

graphically adding condition legs to the condition on the display; and

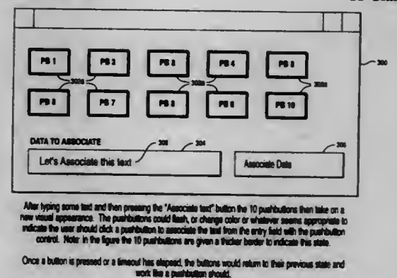
graphically associating at least one object with each condition leg on the display, wherein the at least one object is executed when the condition evaluates to the corresponding condition leg, and wherein the condition, the condition legs, and the at least one object form a dynamically modifiable and interchangeable graphical map of the rule on the display.



5,815,153
MULTIFUNCTION CONTROL WITH CHANGEABLE APPEARANCE

Scott Harlan Isensee, Georgetown, and Craig Ardner Swearingen, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1996, Ser. No. 753,122
Int. Cl.[6] G06F *3/00*
U.S. Cl. 345—354 **11 Claims**



1. A data processing system that displays at least one user interactable object, comprising:

means for causing said object to be displayed having a first appearance and a second appearance wherein said object comprises at least one control capable of altering its appearance between a first state and a second state;

means for associating a first function with said object having said first appearance and a second function with said object having said second appearance, said means for associating comprises means for linking first information to said object having said first appearance and second information to said object having said second appearance and means for prompting a user to enter said first and second information;

wherein a user will implement said first function by selecting said object having said first appearance, and will implement said second function by selecting said object having said second appearance.

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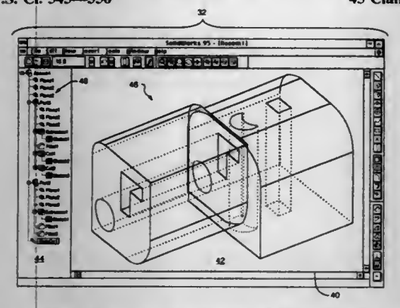
5,815,154

GRAPHICAL BROWSER SYSTEM FOR DISPLAYING AND MANIPULATING A COMPUTER MODEL

Jon K. Hirschtick, Winchester; Stephen G. Krug, Chestnut Hill, and Robert P. Zuffante, Newton, all of Mass., assignors to SolidWorks Corporation, Concord, Mass.

Filed Dec. 20, 1995, Ser. No. 574,629
Int. Cl.[6] G06F *3/14;* G06T *17/40*
U.S. Cl. 345—356 43 Claims



1. A graphical browser, for displaying and manipulating a computer model generated by a computer aided design system, comprising:

data accessing means, for accessing data indicative of features of the model and data indicative of geometric characteristics of the model, wherein the data indicative of features of the model corresponds to operations for constructing the model using computer-aided design software;

model display means, coupled to said data accessing means, for displaying at least one image indicative of the geometric characteristics of the model;

feature presentation means, coupled to said data accessing means, for presenting a graphical image indicative of features of the model; and

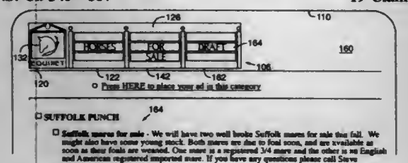
feature manipulation means, coupled to said data accessing means and said feature presentation means, for allowing a user to graphically manipulate portions of said graphical image indicative of features of the model to provide corresponding changes to the data indicative of features of the model and to the data indicative of geometric characteristics of the model.

5,815,155

METHOD AND APPARATUS FOR NAVIGATING AN INFORMATION HIERARCHY

James H. Wolfston, Jr., Portland, Oreg., assignor to Universal Algorithms Incorporated, Portland, Oreg.

Filed Aug. 7, 1996, Ser. No. 700,567
Int. Cl.[6] G06F *3/00*
U.S. Cl. 345—357 19 Claims



1. A computer-implemented method for facilitating navigation by a user through a hierarchy of computer-presented information, the method comprising:

a. presenting on a computer screen information associated with one navigational level and a clickable actuator that is representative of the one navigational level, thematically or metaphorically representative of the topic of information being navigated, and that is selectable by the user to return to the one navigational level; and

b. presenting in response to a user selection of information presented at the one navigational level:

i. a screen display of information representative of a subsequent navigational level;

ii. the clickable actuator representative of the one navigational level; and

iii. a second clickable actuator representative of the subsequent navigational level, having pictorial subject matter in common with the first actuator, and being thematically or metaphorically consistent with the topic of information being navigated,

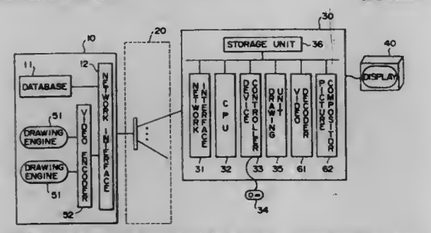
the presentation of the first and second clickable actuators at the subsequent navigational level being juxtaposed to provide the user a thematic or metaphoric reference to the topic of information being navigated and to provide information identifying the user's current position in the information hierarchy, path information concerning a route to the present place in the hierarchy, and a clickable means to return to any location previously traversed in the hierarchy.

5,815,156

INTERACTIVE PICTURE PROVIDING METHOD

Akikazu Takeuchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 520,618
Claims priority, application Japan, Aug. 31, 1994, 6-206286
Int. Cl.[6] G06T *17/00*
U.S. Cl. 345—419 5 Claims



1. An interactive picture providing method comprising the steps of:

preparing, in a server, three-dimensional pictures of a virtual reality space from predetermined positions;

supplying data of a position in said virtual reality space from a user terminal to said server via a network;

providing a picture of said virtual reality space corresponding to the position from said server to said user terminal via said network;

providing, from said server to said user terminal, a part of the picture seen from a predetermined position in said virtual reality space;

generating, in said user terminal, another part of the picture seen from the specified position in said virtual reality; and

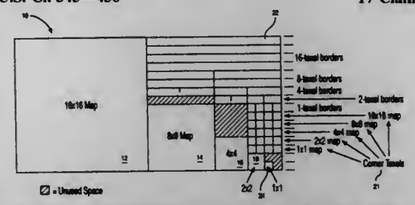
compositing and displaying, in said user terminal, the picture generated in said user terminal and the picture provided from said server.

5,815,157

METHOD AND APPARATUS FOR TEXTURE BORDER ADDRESS MAPPING IN RECTANGULAR COORDINATES

Andrew D. Bowen, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1995, Ser. No. 570,218
Int. Cl.[6] G09B *5/00*
U.S. Cl. 345—430 17 Claims



1. A method, implemented in a computer, of storing a texture map having a border in said computer, comprising the steps of:

allocating a rectangular memory map in said computer for said texture map having a right-hand portion and a left-hand portion;

storing said texture map in said left-hand portion of said rectangular memory map,

storing submaps of said texture map in one-half size portions in the right-hand portion of said rectangular memory map; and

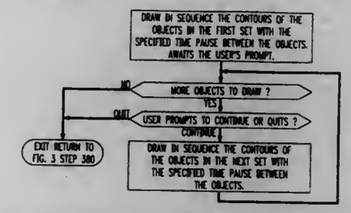
storing the borders of said texture map in the right-hand portion of said rectangular memory map.

5,815,158

METHOD AND APPARATUS FOR VIEWING LARGE ENSEMBLES OF THREE-DIMENSIONAL OBJECTS ON A COMPUTER SCREEN

Boris Dmitrievich Lubachevsky, Bridgewater, and Ibrahim Emre Telatar, North Plainfield, both of N.J., assignors to Lucent Technologies, Murray Hill, N.J.

Filed Dec. 29, 1995, Ser. No. 581,387
Int. Cl.[6] G06T *15/40*
U.S. Cl. 345—427 21 Claims



1. A method for visually rendering a three dimensional graphics structure having a plurality of objects on a two dimensional display, said method comprising the steps of:

measuring a distance from a view point to a reference point for each object, said view point being a fixed coordinate in a view reference coordinate system of said display corresponding to an eye position of a user;

rendering said objects one at a time on said display based on measured distances from said view point to each said reference point, wherein a time determined and controlled by said user is interposed between rendering of each said object;

said step of rendering including the steps of

grouping a set of objects representing a portion of said three dimensional graphics structure;

marking a first and last object in said set of objects; and

selecting a rate at which each object of said set of objects is to be rendered,

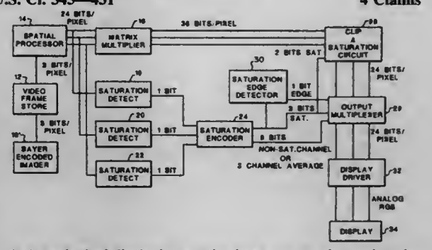
wherein said user can analyze said structure by rendering different sets of objects which represents different portions of said structure.

5,815,159

SPATIALLY MAPPED MONOCHROME DISPLAY IN A COLOR IMAGE

Andrew Setsu Katayama, Cardiff-by-the-Sea, and Gregory James Martin, Carlsbad, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1996, Ser. No. 620,434
Int. Cl.[6] G06T *5/00*
U.S. Cl. 345—431 4 Claims



1. A method of displaying a color image on an electronic color display comprising the steps of:

providing a digital color image signal which is a matrix of pixels, each pixel having first, second, and third color components;

for each pixel, determining whether or not two of the three color components are in saturation, and, if they are, setting the signal level for each of the three color components at the signal level of the third color component; and

displaying said color image pixel as a monochrome pixel on an electronic color display;

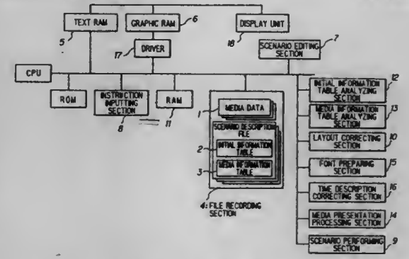
and, if they are not, displaying said color pixel as a color pixel on said electronic color display.

5,815,160

PRESENTATION SYSTEM FOR CORRECTING POSITIONAL AND SIZE INFORMATION OF IMAGES TO COMPENSATE FOR RESOLUTION OF DISPLAY APPARATUS

Tsuneyuki Kikuchi, and Hiroaki Ueda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 29, 1996, Ser. No. 626,390
Claims priority, application Japan, Mar. 29, 1995, 7-071932
Int. Cl.[6] G06T *3/00*
U.S. Cl. 345—439 4 Claims



1. A presentation system having a file recording section for recording a variety of media data for presentation and scenario description file specifying a presentation procedure of a manuscript

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for presentation, a text RAM and a graphic RAM for storing temporarily display media data designated by said scenario description file among said variety of media data for displaying on a display device for presentation, a scenario editing section for preparing said scenario description file and controlling screen display of said display media data, an instruction inputting section for inputting instructions for preparing said scenario description file and reproducing a presentation, and a scenario performing section for controlling reproduction of said presentation according to said scenario description file and said instructions; comprising:

a layout correcting section controlled by said scenario performing section for correcting positional information and sizes of display images of said display media data according to the resolution of said display device for presentation, said positional information and said sizes being prepared and described in said scenario description file according to the resolution of a display device employed for preparing said scenario description file.

5,815,161

SYSTEM FOR JOINING ELEMENTS TO COMPLEX JUNCTIONS AND LINKS IN ROAD NETWORK REPRESENTATION FOR VEHICLES

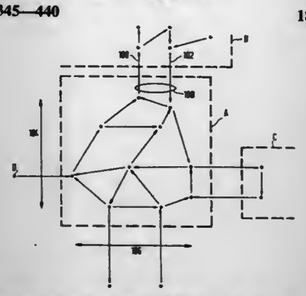
Carla J. M. Emmerink, Eindhoven, and Hendrik H. Veenker, Emmercompascuum, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 12, 1996, Ser. No. 662,187

Claims priority, application European Pat. Off., Jun. 16, 1995, 95201619

Int. Cl.[6] G06T *5/00*

U.S. Cl. 345—440 **18 Claims**



1. A method for storing geographical road data in multiple hierarchically organized levels by from a relatively lower level that features detailed representations of road links and junctions, deriving at a relatively globalized level an abstracted representation from such detailed representations, characterized by the steps of:

a. at such lower level, joining a set of elementary junctions to a complex junction on the basis of predetermined coherencies among the elementary junctions of the set;

b. repeating step a. until all complex junctions have been found;

c. ascertaining all border elements of a particular set and all elementary external links between those border elements and any element of one particular other set, inclusive of all allowed traffic directions on such elementary external road links, and collectively replacing said elementary external road links by a single complex external road link while mapping said allowed traffic directions thereon;

d. repeating step c. until all complex external road links between sets so paired have been found;

e. representing each remaining elementary junction and each complex junction by a respective single node, while representing each remaining elementary external road link and each complex external road link by a single higher level road link with associated original or mapped traffic directions, respectively.

5,815,162

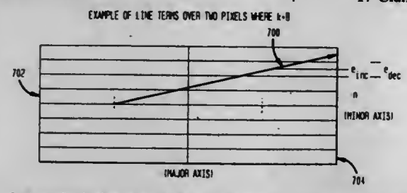
SYSTEM AND METHOD OF DRAWING ANTI-ALIASED LINES USING A MODIFIED BRESENHAM LINE-DRAWING ALGORITHM

Marshall P. Levine, Philadelphia, Pa., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Filed Apr. 19, 1996, Ser. No. 634,877

Int. Cl.[6] G06T *11/00*

U.S. Cl. 345—443 **17 Claims**



1. A method of drawing an anti-aliased line, comprising the steps of:

(a) determining a first length in sub pixels of the line along a major axis of the line;

(b) determining a second length in sub pixels of the line along a minor axis of the line;

(c) calculating a slope of the line;

(d) quantizing the slope to any one of a set of number values;

(e) calculating an error value if the quantized slope has a remainder;

(f) calculating a coverage value without performing division;

(g) adjusting the coverage based on the error value;

(h) drawing a point for the line utilizing a first pixel and a second pixel orthogonally juxtaposed with the first pixel along the minor axis of the line, wherein the step of drawing the point comprises:

(1) drawing the first pixel having a first coverage equal to the coverage value, and

(2) drawing the second pixel having a second coverage equal to one minus the coverage value; and

(i) iterating steps (g) and (h) until the line is complete.

5,815,163

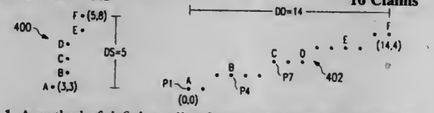
METHOD AND APPARATUS TO DRAW LINE SLICES DURING CALCULATION

Giang H. Dao, Houston, and John J. Watters, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 381,075, Jan. 31, 1995, abandoned. This application May 23, 1997, Ser. No. 862,668

Int. Cl.[6] G06F *15/00*

U.S. Cl. 345—443 **16 Claims**



1. A method of defining a line formed of a plurality of slices in a computer, each slice comprising a plurality of pixels, comprising the steps of:

determining a length for one of said slices, wherein said length is determined by counting the number of pixels in said slice;

determining a number of contiguous slices, each slice having the same number of pixels thereby defining said length;

generating line data for each of said slices of said length; and

as line data is generated in said generating step, maintaining a count of slices of said length for which line data has not been generated.

5,815,164

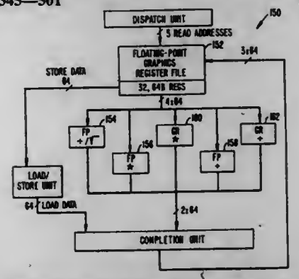
IMAGE RESCALING IN A PARALLEL PROCESSOR

Stephen K. Howell, Santa Clara, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Nov. 27, 1995, Ser. No. 562,878

Int. Cl.[6] G06F *15/00;* **G06T** *1/00*

U.S. Cl. 345—501 **20 Claims**



1. In a computer system including a processor having the capability of operating on words no greater than words having n-bit values, the system also including an image buffer capable of storing such values, a method of rescaling an image containing pixels, wherein pixels in the image are individually defined by a word having such an n-bit value, the method comprising:

loading a first plurality of n-bit long word components associated with corresponding pixels in the image into the processor in one machine instruction;

rescaling the first plurality of word components in parallel; and

packing the rescaled n-bit value word components into the image buffer in one machine instruction.

5,815,165

GRAPHICS PROCESSOR

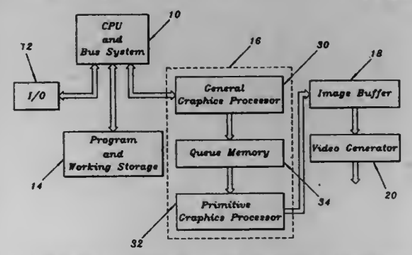
Stefan Blixt, Hägervägen 10, S-198 OO Bålsta, Sweden

Continuation of Ser. No. 627,864, Dec. 17, 1990, abandoned. This application Nov. 26, 1993, Ser. No. 157,451

Claims priority, application Sweden, Jan. 10, 1990, 9000083

Int. Cl.[6] G06T *1/20*

U.S. Cl. 345—506 **6 Claims**



1. A graphics processor for writing information representing at least a part of an image into an image buffer of predetermined size, comprising:

(a) high level graphics processor means for converting high level graphics instructions into low level graphics instructions, at least some of which contain pixel data;

(b) queue memory means connected to said high level graphics processor means, for receiving and storing said low level graphics instructions in the order they are generated by said high level graphics processor means; and

(c) low level graphics processor means connected to said queue memory means and said image buffer, for reading and executing said low level graphics instructions from said queue memory means one after the other and for repeatedly copying at least some of said pixel data into different memory locations of said image buffer corresponding to different positions in said image as specified by said low level graphics instructions.

5,815,166

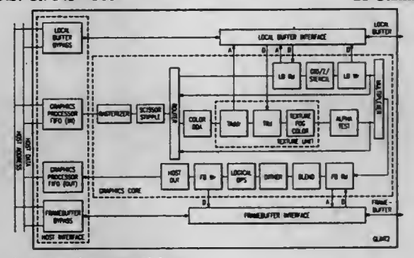
GRAPHICS SUBSYSTEM WITH SLAVEABLE RASTERIZER

David Robert Baldwin, Weybridge, United Kingdom, assignor to 3DLabs Inc., Ltd., Hamilton, Bermuda

Filed Mar. 24, 1995, Ser. No. 410,354

Int. Cl.[6] G06T *1/20*

U.S. Cl. 345—506 **21 Claims**



1. A rasterizer comprising:

an input interface, connected to receive commands and data;

programmable logic connected

to receive commands from a preceding subsystem; and to operate in a first or a second mode in accordance with said commands, and

when operation in said first mode has been selected, said logic operates in a free-running asynchronous mode to generate a sequence of pixel location identifiers; and

when operation in said second mode has been selected, said logic generates individual pixel location identifiers only, and only when individually commanded by one of said commands; and

an output interface connected to provide said sequence of pixel location identifiers as an output.

5,815,167

METHOD AND APPARATUS FOR PROVIDING CONCURRENT ACCESS BY A PLURALITY OF AGENTS TO A SHARED MEMORY

Manish Muthal; Nilesh V. Shah, and Kuljit Bains, all of Folsom, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 27, 1996, Ser. No. 672,099

Int. Cl.[6] G06F *15/167*

U.S. Cl. 345—512 **16 Claims**

1. A computer system comprising:

first and second agents;

a shared memory accessible by the first and second agents, the shared memory having a first memory portion and a second memory portion, at least a portion of the second memory portion to store data associated exclusively with the second agent; and

a switch arrangement to provide (i) a first data path between the first agent and the second memory portion when in a first state, and to provide (ii) a second data path between the first agent and the first memory portion and (iii) a third data path between the second agent and the second memory portion when in a second state, the second and third data paths being distinct and provided in parallel so as to facilitate simultaneous access to the first and second memory portions by the

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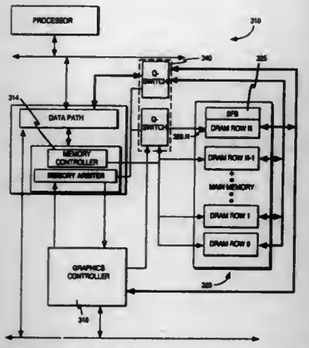


first and second agents respectively when the switch arrangement is in the second state.

5,815,168

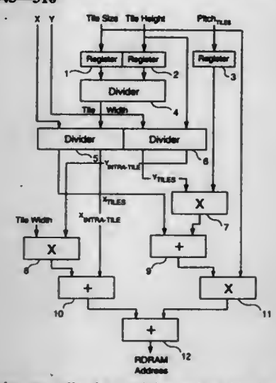
TILED MEMORY ADDRESSING WITH PROGRAMMABLE TILE DIMENSIONS

Bradley Andrew May, San Jose, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Dec. 21, 1995, Ser. No. 576,871

Int. Cl.[6] G06F *12/06;* **G09G** *5/36*

U.S. Cl. 345—516 **32 Claims**



1. A display controller for receiving and storing display data in a display memory in a tiled address format, said display controller comprising:

tile shape storage means for storing tile shape data comprising tile size data, tile height data, and tile pitch data;

pixel location data input means, for receiving pixel data location data comprising X and Y position data; and

display memory address generating means, coupled to said pixel location data input means for processing tile shape data with the pixel location data to generate display memory address data

wherein said display memory address generating means comprises:

a first divider means, for receiving the tile size data and the tile height data and outputting tile width data;

a second divider means, coupled to said first divider means and said pixel location data input means, for receiving the X position data and the tile width data and outputting horizontal tile position and horizontal pixel position within a horizontally adjacent tile; and

a third divider means, coupled to said first divider means and said pixel location data input means, for receiving the Y position data and the tile height data and outputting vertical tile position and vertical pixel position within a vertically adjacent tile.

5,815,169

FRAME MEMORY DEVICE FOR GRAPHICS ALLOWING SIMULTANEOUS SELECTION OF ADJACENT HORIZONTAL AND VERTICAL ADDRESSES

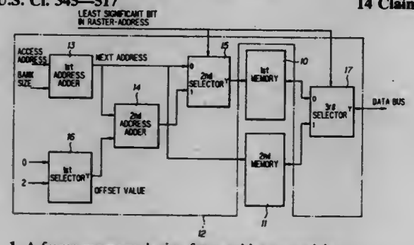
Mamoru Oda, Noda, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1996, Ser. No. 613,673

Claims priority, application Japan, Apr. 10, 1995, 7-084167

Int. Cl.[6] G06F *12/06*

U.S. Cl. 345—517 **14 Claims**



1. A frame memory device for graphics comprising:

a frame memory having a matrix of addresses arranged on plural lines in correspondence with pixels arranged on a display screen, said frame memory being logically partitioned into four banks A through D, addresses on the banks A and B are arranged alternately on odd lines in said matrix while addresses on the banks C and D are arranged alternately on even lines; and

controlling means for controlling said frame memory, said controlling means simultaneously selecting addresses horizontally and vertically adjacent to an address currently being accessed.

5,815,170

MEMORY CONTROL METHOD OF CHARACTER MULTIPLEXED BROADCAST RECEIVER

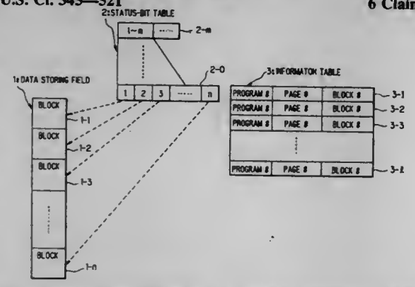
Tsuyoshi Kimura, and Masahiko Nagata, both of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 755,411

Claims priority, application Japan, Nov. 29, 1995, 7-311272

Int. Cl.[6] G06F *13/16*

U.S. Cl. 345—521 **6 Claims**



1. A memory control method of a character multiplexed broadcast receiver for controlling utilization of a data storing field of a memory provided for storing data of pages of programs emitted in a character multiplexed broadcast; comprising:

a step of checking when data of a page of a program are received whether the same data of the same page of the same program with said data of said page of said program are already stored or not in any of plurality of blocks provided in the data storing field by searching an information table comprising a plurality of lines sorted, in each of said plurality of lines being registered information of data stored in one of said plurality of blocks;

a step of storing said data of said page of said program in available one of said plurality of blocks found vacant by retrieving a status bit table comprising a basic bit sequence, logic of each bit of said basic bit sequence indicating an utilization status of corresponding each of said plurality of blocks, in case that the same data of the same page of the same program with said data of said page of said program are checked not stored at said step of checking;

a step of registering information of said data of said page of said program, stored at said step of storing, in said information table by adding a new line to said plurality of lines; and

a step of sorting said information table according contents of said plurality of lines added with said new line.

5,815,171

SLIDING ASSEMBLY FOR PLOTTERS AND METHOD FOR ADJUSTMENT OF SPACING BETWEEN THE PRINTING HEAD AND THE PRINTING MEDIA

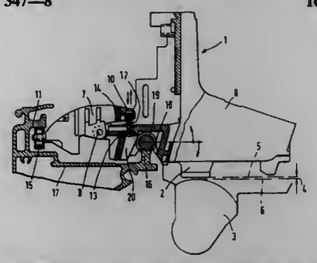
Joaquim Brugue, Barcelona, Spain, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 17, 1995, Ser. No. 559,911

Claims priority, application European Pat. Off., Nov. 25, 1994, 94500196

Int. Cl.[6] B41J *23/00;11/20;11/22*

U.S. Cl. 347—8 **16 Claims**



1. A sliding assembly for a plotter which enables adjustment of spacing between a printing head and printing media, said sliding assembly comprising:

a main sliding guide oriented parallel to said printing media;

a movable carriage, including said printing head, positioned on said main sliding guide by mounting means, said mounting means enabling simultaneous lengthwise sliding of said carriage on said main sliding guide and pivoting of said carriage with respect to said main sliding guide, said carriage comprising first and second units connected by articulated joint means which enables mutual positions of said first and second units to be angularly adjusted with respect to each other, said articulated joint means including pivot adjustment means for obtaining a desired adjustment value of angle between said first and second units and, as a result, an adjustment of spacing between said printing head and said printing media; and

abutment means for limiting the pivoting of said carriage by interaction with said first unit.

5,815,172

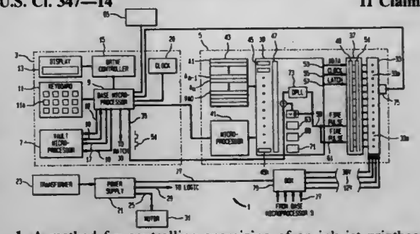
METHOD AND STRUCTURE FOR CONTROLLING THE ENERGIZING OF AN INK JET PRINTHEAD IN A VALUE DISPENSING DEVICE SUCH AS A POSTAGE METER

Sungwon R. Moh, Wilton, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Aug. 23, 1996, Ser. No. 707,984

Int. Cl.[6] B41J *29/38*

U.S. Cl. 347—14 **11 Claims**



1. A method for controlling energizing of an ink jet printhead comprising the steps of:

generating motor pulses to a motor to activate the motor to move the printhead at a desired speed over a recording medium;

providing a motor pulse signal indicative of an actual motor pulse frequency;

generating and sending a first fire pulse signal including a fire pulse which is fired at a fire pulse frequency from an ASIC to an ink jet printhead driver chip to selectively energize ink jet printhead nozzles to eject drops of ink onto the recording medium based on a predetermined relationship between an expected motor pulse frequency and the fire pulse frequency;

compensating for variations in the speed of the ink jet printhead movement caused by variations in the actual motor pulse frequency relative to the expected motor pulse frequency by using the ASIC for continuously comparing the motor pulse signal indicative of the actual motor pulse frequency to the fire pulse frequency to determine if the predetermined relationship exists and if the predetermined relationship does not exist adjusting the fire pulse frequency based upon the variations to the actual motor pulse frequency to maintain the predetermined relationship thereby synchronizing the ink jet printhead movement with the energizing of the printhead nozzles.

5,815,173

NOZZLE STRUCTURES FOR BUBBLEJET PRINT DEVICES

Kia Silverbrook, Wollahra, Australia, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 31,919, Mar. 16, 1993, abandoned, which is a continuation of Ser. No. 827,985, Jan. 29, 1992, abandoned. This application Sep. 1, 1993, Ser. No. 115,128

Claims priority, application Australia, Jan. 30, 1991, PK4374; Feb. 22, 1991, PF4731; Feb. 22, 1991, PF4732; Feb. 22, 1991, PF4733; Feb. 22, 1991, PF4734; Feb. 22, 1991, PF4735; Feb. 22, 1991, PF4736; Feb. 22, 1991, PF4737; Feb. 22, 1991, PF4738; Feb. 22, 1991, PF4739; Feb. 22, 1991, PF4740; Feb. 22, 1991, PF4741; Feb. 22, 1991, PF4742; Feb. 22, 1991, PF4743; Feb. 22, 1991, PF4744; Feb. 22, 1991, PF4745; Feb. 22, 1991, PF4746; Dec. 23, 1991, 89996/91

Int. Cl.[6] B41J *2/205;2/145;2/05*

U.S. Cl. 347—15 **31 Claims**

1. A monolithic ink jet head in which a plurality of nozzles are arranged in two directions for printing a multi-tone image by forming a plurality of pixels at a pixel ditch on a recording medium, each of the pixels having a gradation corresponding to a number of droplets of an ink of a same color deposited, comprising:

a monolithic substrate; and

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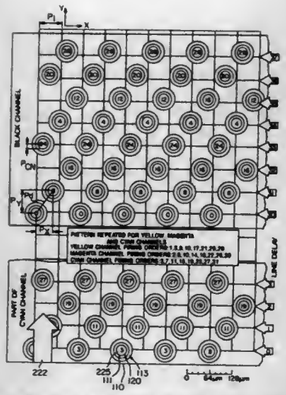


a plurality of nozzles for ejecting the droplets of the same color provided on said monolithic substrate for ejecting the ink, said plurality of nozzles being arranged on said monolithic substrate in an arranging direction and a transverse direction which is transverse to said arranging direction such that a shortest distance between said nozzles which are adjacent, is shorter in at least one of said arranging direction and said transverse direction than the pixel pitch, and a shortest distance between said nozzles which are adjacent in an other of said arranging direction and said transverse direction which is not the one of said arranging direction and said transverse direction is not substantially longer than the pixel pitch.

5,815,174

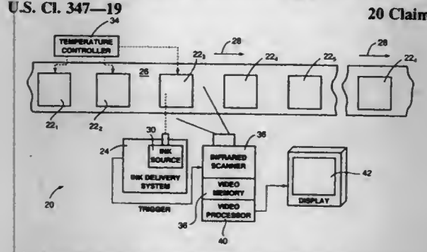
SYSTEM AND METHOD OF THERMALLY VERIFYING FRESHLY PRINTED IMAGES

J. James Stone, Northbrook, Ill., assignor to Videojet Systems International, Inc., Wood Dale, Ill.

Filed Jan. 19, 1996, Ser. No. 588,995

Int. Cl.[6] B41J *29/393;2/015;* **H04N** *1/00*

U.S. Cl. 347—19 **20 Claims**



1. A method of detecting a latent image on a substrate formed with an invisible ink by sensing temperature variations in a scanned field of view, the method comprising the steps of, providing a temperature differential between the invisible ink and the substrate, applying, after the providing step, a quantity of the invisible ink to the substrate to form the latent image thereon, scanning the substrate with a heat-sensitive scanner before the applied ink reaches thermal equilibrium with the substrate, and outputting an electrical signal from the heat-sensitive scanner, the electrical signal having information therein representative of the image formed by the ink on the substrate.

5,815,175

METHOD AND ARRANGEMENT FOR MONITORING THE FUNCTIONING OF AN INK PRINT HEAD

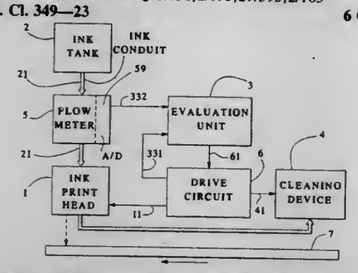
Michael Seikel, Berlin, Germany, assignor to Francotyp-Postalia AG & Co., Birkenwerder, Germany

Filed Sep. 11, 1996, Ser. No. 712,272

Claims priority, application Germany, Oct. 6, 1995, 195 37 160.7

Int. Cl.[6] B41J *29/38;2/195;29/393;2/165*

U.S. Cl. 349—23 **6 Claims**



1. A method for monitoring functioning of an ink print head, said ink print head having a plurality of nozzles respectively supplied with ink having a polarizable component, said ink print head ejecting ink droplets from said nozzles, based upon pulsed actuation of actuators respectively allocated to said nozzles each ink droplet containing a known volume of ink, said method comprising the steps of:

continuously monitoring a quantity of ink supplied from an ink source to said ink print head and generating a first running digital value corresponding to said quantity;

exciting respective actuators to eject ink droplets from respective nozzles and counting a number of excitation pulses supplied to said actuators and generating a second running digital value corresponding to said number of pulses;

comparing said first running digital value and said second running digital value and interrupting a printing mode of said print head and initiating a cleaning procedure to clean said nozzles given deviation of said first running digital value and said second running digital value from each other exceeding a predetermined difference;

continuing to generate said first running digital value during said cleaning procedure and evaluating said first running digital value during said cleaning procedure as an indicator of effectiveness of said cleaning procedure;

after said cleaning procedure, re-initiating said printing mode and continuing to generate said first running digital value and said second running digital value starting from a same initial value; and

again comparing said first running digital value and said second running digital value and, if a difference between said first running digital value and said second digital value still exceeds said predetermined difference, again interrupting said printing mode.

5,815,176

MULTI-FINNED WIPING SYSTEM FOR INKJET PRINTHEADS

Catherine A. Rotering, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1996, Ser. No. 593,960

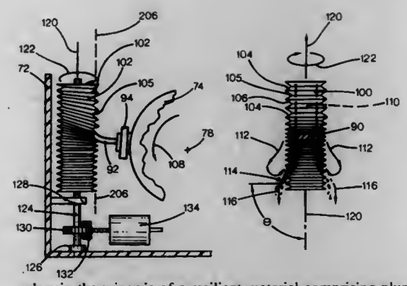
Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—33 **27 Claims**

1. A finned wiping system for wiping an inkjet printhead that accumulates ink residue when used in an inkjet printing mechanism having a chassis, comprising:

a service station supported by the printing mechanism chassis;

a wiper supported by the service station to selectively contact and wipe the printhead to remove ink residue therefrom,



wherein the wiper is of a resilient material comprising plural fins arranged to define an interstice between adjacent fins to capture the ink residue in the interstice, with the plural fins defining a cleaning region across which the printhead traverses from one fin to the next adjacent fin through relative motion of the printhead and wiper and

a cleaner supported by the service station to selectively contact and clean the wiper,

wherein the cleaner comprises a blade of a resilient material selected to press adjacent fins together when contacting the wiper to pump the ink residue from the interstice.

5,815,177

INK SPREADING GROOVES FORMED FOR SPREADING AND DRYING INK DRIPPED DOWN FROM NOZZLES OF INK JET RECORDING DEVICE

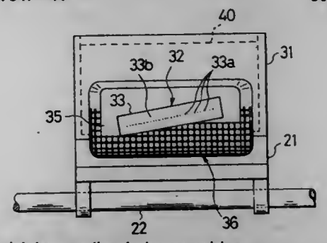
Toyonori Sasaki, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 29, 1996, Ser. No. 706,399

Claims priority, application Japan, Aug. 30, 1995, 7-246691

Int. Cl.[6] B41J *2/135;2/165*

U.S. Cl. 347—44 **30 Claims**



1. An ink jet recording device comprising:

a recording head including a nozzle plate attached to a position on a surface of said recording head, said nozzle plate having a surface formed with a plurality of nozzles from which ink droplets are ejected; and

a protection member surrounding said recording head so as to expose the surface of said nozzle plate, said protection member having an outer surface,

wherein the outer surface of said protection member is substantially flush with the surface of said nozzle plate, and a plurality of ink spreading grooves are formed in at least a part of the outer surface of said protection member, said plurality of ink spreading grooves forming a continuous network of grooves in which each of the grooves intersects a plurality of others of the grooves and promoting evaporation of residual ink clinging to the surface of said nozzle plate by receiving the residual ink and spreading all the received residual ink therealong by capillary action of said plurality of ink spreading grooves, said plurality of ink spreading grooves holding all of the received residual ink until all of the received residual ink evaporates.

5,815,178

PRINTING METHOD AND APPARATUS EMPLOYING ELECTROSTATIC DROP SEPARATION

Kia Silverbrook, Leichhardt, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

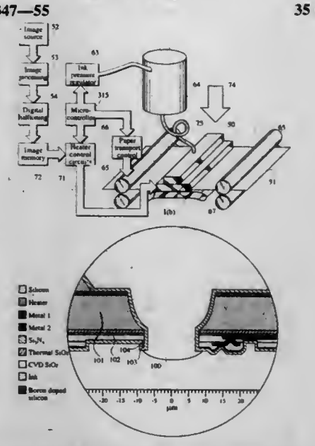
PCT No. PCT/OS96/04886, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO96/32278, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 9, 1996, Ser. No. 765,127

Claims priority, application Australia, Apr. 12, 1995, PN95/2313

Int. Cl.[6] B41J *2/06*

U.S. Cl. 347—55 **35 Claims**



1. A drop on demand printing apparatus comprising:

(a) nozzle means including an array of closely spaced drop ejection orifices;

(b) manifold means for supplying a body of ink in common communication with the orifices of said nozzle means;

(c) means for applying a positive pressure to the body of ink in said manifold means, sufficient to cause ink to protrude from said orifices;

(d) address means for energizing ink in selected orifices to cause the energized ink to protrude further from the selected orifices under the influence of the positive pressure applied to the body of ink; and

(e) means for producing an electric field between ink in said orifices and a print station spaced opposite said nozzle means, said electric field being sufficient to attractively separate an ink drop from such further protruding ink in selected orifices, said address mean being capable of causing the energized ink to protrude further from the selected orifices even in the absence of the electric field.

5,815,179

BLOCK FAULT TOLERANCE IN INTEGRATED PRINTING HEADS

Kia Silverbrook, Leichhardt, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US96/04896, § 371 Date Dec. 4, 1996, § 102(e) Date Dec. 4, 1996, PCT Pub. No. WO96/32264, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 10, 1996, Ser. No. 750,431

Claims priority, application Australia, Apr. 12, 1995, PN2325

Int. Cl.[6] B41J *2/05*

U.S. Cl. 347—59 **39 Claims**

1. In an integrated printing head having a plurality of printing actuators, apparatus for correcting faults in the data transfer to such actuators, said apparatus comprising:

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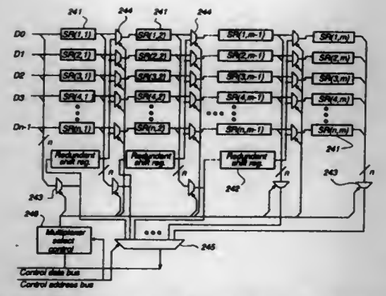


(a) a plurality of data transfer devices which, in the absence of faults, transfer data to the printing actuators;
(b) at least one redundant data transfer device;
(c) means for determining which of the data transfer device contain faults;
(d) means for connecting the output of an operational data transfer device which precedes such faulty data transfer device, in terms of data flow, to the input of a corresponding redundant data transfer device; and
(e) means for connecting the output of said corresponding redundant data transfer device to the input of the data transfer device which normally is connected to the output of said faulty data transfer device, in terms of data flow.

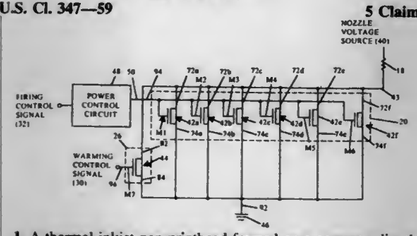
5,815,180

THERMAL INKJET PRINTHEAD WARMING CIRCUIT

Michael J. Barbour, and George H. Corrigan, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 17, 1997, Ser. No. 819,126
Int. Cl.[6] B41J *2/05*

U.S. Cl. 347—59 **5 Claims**



1. A thermal inkjet pen printhead formed on a common die, the printhead comprising:
a plurality of inkjet nozzle chambers formed in the die;
for each one nozzle chamber, a corresponding heating resistor and a corresponding transistor being formed in the die, wherein the corresponding heating resistor is located within said one nozzle chamber, and wherein the corresponding transistor is segmented having a first portion and a second portion, the second portion being smaller than the first portion, wherein the first portion and second portion are electrically coupled to the corresponding heating resistor, and wherein the second portion is smaller than the first portion so as to have a maximum current magnitude rating which is less than a maximum current magnitude rating of the first portion, wherein the first portion comprises a plurality of first transistive devices and the second portion comprises a second transistive device;
wherein to perform a firing at said one nozzle chamber both the first portion and second portion of the transistor are activated to generate a firing pulse which heats the heating resistor to a temperature sufficient to eject ink from the corresponding nozzle chamber, and wherein to perform a warming at said one nozzle chamber the second portion and not the first portion of the transistor is activated to generate a warming pulse which warms the heating resistor to a temperature insufficient to eject ink from the corresponding chamber.

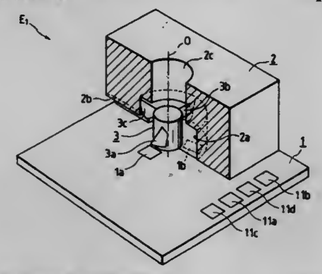
5,815,181

MICROMACHINE, LIQUID JET RECORDING HEAD USING SUCH MICROMACHINE, AND LIQUID JET RECORDING APPARATUS HAVING SUCH LIQUID JET RECORDING HEADMOUNTED THEREON

Toshio Kashino, Chigasaki; Hiroshi Sugitani, Machida; Masaaki Okada, Sanjo, and Kiyomitsu Kudo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1996, Ser. No. 671,369
Claims priority, application Japan, Jun. 28, 1995, 7-184760; Dec. 18, 1995, 7-348304; Dec. 26, 1995, 7-351416
Int. Cl.[6] B41J *2/05;2/19*

U.S. Cl. 347—65 **13 Claims**



1. A micromachine comprising:
at least one heat generating unit arranged on a surface of a substrate;
means for retaining liquid having a liquid retaining portion surroundind said at least one heat generating unit; and
a rotator rotatively supported in said liquid retaining portion of said means for retaining liquid,
wherein said rotator comprises means for rotating said rotator by the liquid when boiled in said liquid retaining portion by heat generated by said at least one heat generating unit.

5,815,182

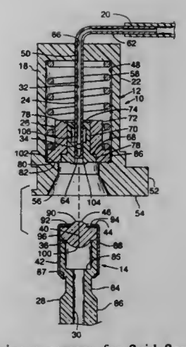
FLUID INTERCONNECT FOR INK-JET PEN

David R. Otis, Corvallis, Oreg.; Ngoc-Diep T. Nguyen, Vancouver; Thomas G. Cocklin, Ridgefield, both of Wash., and John G. Wydronek, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 4, 1995, Ser. No. 566,985
Int. Cl.[6] B41J *2/175;* **A61B** *17/43*

U.S. Cl. 347—85 **22 Claims**

1. A fluid interconnect for connecting an ink supply to an ink-jet pen, the fluid interconnect comprising:
an outlet assembly comprising:
a housing;
an elongated needle having a first end inside the housing and a second end connectable to an ink container, the needle having an axial bore that terminates near the first end and is contiguous with a lateral hole in the needle; and
a collar positioned on the needle, the collar being movable into a closed position in which the collar covers the lateral hole to occlude fluid flow through the needle, the collar also being movable into an open position in which the collar is away from the lateral hole; and an inlet assembly comprising:



a fitment having a passage for fluid flow, the fitment being insertable into the housing; and
a penetrable septum mounted to the fitment, the septum being penetrated by the first end of the needle as the fitment is inserted into the housing, the septum contacting the collar to move the collar from the
closed position to the open position, in which the lateral hole is exposed within the passage.

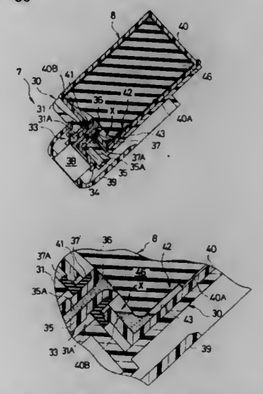
5,815,183

INK CARTRIDGE HAVING A REABORATION CAPABILITY FOR FREE INK

Toyonori Sasaki, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 23, 1996, Ser. No. 636,473
Claims priority, application Japan, Jul. 12, 1995, 7-200570
Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—86 **17 Claims**



1. An ink cartridge which is detachably mounted on a head holder having an ink supply member which projects from the head holder and serves to supply ink to a recording head, comprising:
a cartridge body containing an ink absorber in which the ink is absorbed;
an ink supply port which is provided to the cartridge body and through which a tip portion of the ink supply member is inserted to supply the ink of said ink absorber to the ink supply member; and
a capillary force generator which is provided in the cartridge body and serves to guide the ink that oozes from said ink absorber, and collects in an open space created when said ink absorber is compressed by the insertion of the ink supply member, to said ink absorber by capillary action to be reabsorbed by said ink absorber.

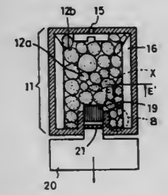
5,815,184

INK CONTAINER HAVING PLURAL POROUS MEMBERS FOR STORING INK AND INK JET APPARATUS HAVING SAID INK CONTAINER

Toshihiko Ujita, Yamato; Hiroshi Sugitani, Machida; Tsuyoshi Orikasa, Musashimurayama; Osamu Sato, Kawasaki; Masahiko Higuma, Tougane; Yasuo Kotaki, Machida, and Jun Hinami, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 379,757, Jan. 27, 1995, abandoned. This application Sep. 15, 1997, Ser. No. 929,086
Claims priority, application Japan, Jan. 31, 1994, 6-009877
Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—89 **19 Claims**



14. A recording unit apparatus comprising:
a recording head for discharging ink;
an ink container for storing and supplying ink to said recording head, said ink container comprising an ink tank having walls providing an enclosed space within an interior of said ink tank, said ink tank having an air induction port for introducing air into said ink tank and an ink outlet remote from said air induction port for guiding the ink out of said ink tank; and
an ink supply tube for supplying ink to said recording head from said ink container, said ink supply tube consisting of a portion projecting out of said ink tank and connecting to said recording head and a portion projecting into said ink tank,
wherein said ink container further comprises a plurality of porous members having open pores for holding the ink, said plurality of porous members including a plurality of inner members and a plurality of outer members, said porous members compressed within said ink tank, each of said porous members having a minimum width less than an inner diameter of said ink outlet, said inner members disposed within the enclosed space so that each of said inner members contacts and presses against only other said porous members, and said outer members disposed within the enclosed space so as to contact and press against said inner members and an interior surface of at least one wall of the ink tank in a lateral direction, the lateral direction being perpendicular to that of gravity, said recording head integrally formed on said ink container so as to incorporate said portion of said ink supply tube projecting out of said ink tank.

5,815,185

INK FLOW HEAT EXCHANGER FOR INKJET PRINTHEAD

Joe R. Pietrzyk, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 13, 1996, Ser. No. 748,726
Int. Cl.[6] B41J *2/19*

U.S. Cl. 347—92 **20 Claims**

1. A printing device comprising:
a substrate having a front surface for facing a medium to be printed upon, said substrate having a back surface;

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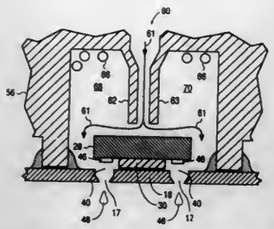


a plurality of ink election chambers on said front surface which define cavities for receiving ink;

a plurality of ink election elements, each ink election element being within a respective ink election chamber, said ink election elements being heated by electrical signals to elect droplets of said ink from a respective nozzle in fluid communication with a respective ink ejection chamber;

an ink conduit having a first wall and a second wall terminating proximate to said back surface of said substrate, so that ink flows through said ink conduit, across at least a portion of said back surface of said substrate, and into said ink ejection chambers; and

at least one bubble accumulation chamber for accumulating bubbles caused by heating of said ink by said substrate due to said electrical signals heating said ink election elements, said at least one bubble accumulation chamber comprising a cavity substantially surrounding said back surface of said substrate, said cavity configured such that said bubbles do not interfere with the flow of ink across said back surface of said substrate and into said ink election chambers.

5,815,186

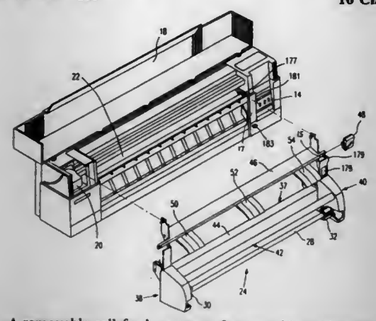
REMOVABLE ROLL-FEED APPARATUS AND METHOD

Richard Lewis; Antonio Hinojosa, both of Barcelona, Spain; Richard Meyer, Alfred, Me.; Cheryl Kisicki, Grand Island, N.Y.; Jennifer P. Palmatier, Milton Mills, N.H.; Joaquim Brugue, and Xavier Regué, both of Barcelona, Spain, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 29, 1996, Ser. No. 658,346

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—101 **16 Claims**



1. A removable roll-feed apparatus for use with a printer/plotter comprising:

a support;

a horizontally disposed shaft mounted to said support, said shaft for mounting a roll of media;

two oppositely disposed and horizontally positioned pins connected to said support, one of said pins being movable between disconnected mode and a connected mode, said pins for contacting said printer/plotter and for positioning said support relative to said printer/plotter in a direction parallel to a first axis, wherein said first axis is the coordinate generally vertically disposed and parallel to the front of the printer/plotter;

a first surface on said support for positioning said support relative to said printer/plotter in a direction parallel to a second axis, wherein said second axis is the coordinate generally perpendicular to the front of the printer/plotter;

a second surface on said support for positioning said support relative to said printer/plotter in a direction parallel to a third axis, wherein said third axis is the coordinate generally horizontally disposed and parallel to the front of the printer/plotter;

said first, second and third axes being mutually perpendicular;

said support having two modes in relation to said printer/plotter, a connected mode and a disconnected mode;

said support being in a connected mode when said pins are in contact with said printer/plotter, said first surface abuts said printer/plotter and said second surface abuts said printer/plotter;

said support being in a disconnected mode when said support is spaced from said printer/plotter and is not in a working relationship with said printer/plotter; and

said support being located relative to said printer/plotter when in a connected mode to allow single sheet media feeding of said printer/plotter when said roll of media is mounted to said shaft and is not being fed to said printer/plotter.

5,815,187

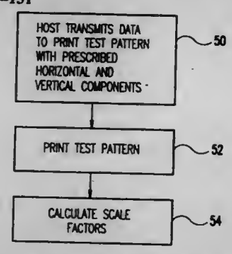
METHOD FOR IMPROVING THE DIMENSIONAL ACCURACY OF LASER PRINTERS

Robert C. Ross, Jr., Daphne, Ala., assignor to Xante Corporation, Mobile, Ala.

Continuation-in-part of Ser. No. 584,004, Jan. 11, 1996. This application Apr. 5, 1996, Ser. No. 628,492

Int. Cl.[6] B41J *2/385*

U.S. Cl. 347—131 **9 Claims**



1. A method for correcting horizontal and vertical scanning errors in a scanning printer in which a controller converts display list inputs to a stored map of data bit positions indicating where corresponding dots are to be printed including the steps of:

printing a pattern with said scanning printer by inputting to said scanning printer data for printing a pattern with horizontal component of a prescribed horizontal length and a vertical component of a prescribed vertical length;

determining the actual length of said horizontal component and the actual length of said vertical component printed in said printing step;

calculating a horizontal correction factor as a function of said prescribed horizontal length and said actual length of said horizontal component;

calculating a vertical correction factor as function of said prescribed vertical length and said actual length of said vertical component;

determining a number of bit positions to be stored in said map of bit positions in response to a display list input using a factor proportional to said horizontal correction factor and said vertical correction factor.

5,815,188

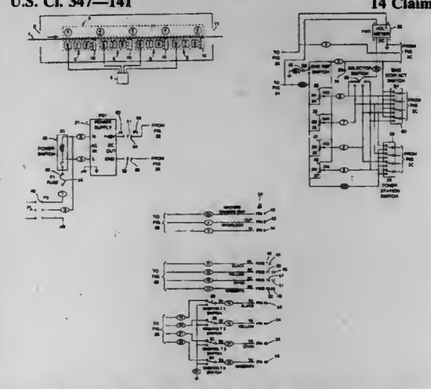
METHOD AND APPARATUS TO REDUCE FOGGING IN ELECTROSTATIC PRINTING

Thomas A. Speckhard, Cottage Grove; Jeffrey C. Pederson, Minneapolis, and Gregory G. Amell, Burnsville, all of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Feb. 15, 1996, Ser. No. 605,257

Int. Cl.[6] B41J *2/06*

U.S. Cl. 347—141 **14 Claims**



1. An antifogging apparatus for an electrostatic printer, comprising:

(a) a power supply;

(b) means for applying voltage from the power supply to at least one station in the electrostatic printer; and

(c) means for electrically isolating printing media from at least one toner station,

wherein the printing media has edge conductive stripes and wherein the apparatus further comprises means for grounding conductive stripes of the printing media.

5,815,189

ELECTROSTATIC WRITING HEAD HAVING A HEAD MEMBER OF MULTIPLE JOINED SECTIONS

Charles F. Hurst, Campbell, and Michael A. Sprauve, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1996, Ser. No. 771,407

Int. Cl.[6] B41J *2/39;2/395*

U.S. Cl. 347—141 **9 Claims**

1. An electrostatic writing head for writing latent images on a medium comprising:

at least two insulative head member sections each having length and width dimensions and each having first and second surfaces; the first surface of each head member section having a top edge and a bottom edge region when viewed along the length dimension thereof; the at least two head member sections being joined together at complementary abutting lateral edges; the joined head member sections forming a first insulative head member;

a plurality of conductors disposed in a plane defined by the first surface of each of the at least two head member sections in an equally spaced and parallel relationship; one end of each conductor, referred to as a nib, being exposed in at least one line at the top edge of each head member section and forming the nib line of the writing head;

a plurality of first surface conductive pads permanently fixed to the first surface of each one of the at least two head member sections and positioned in a lengthwise row in the bottom edge regions thereof; one end of each of the plurality of conductors being attached to a respective one of the plurality of first surface conductive pads; each pair of adjacent conductive pads in the lengthwise row on one of the head member sections being spaced apart in the row by a fixed center-to-center distance;

a plurality of second surface conductive pads permanently fixed to the second surface of each one of the at least two head member sections; each second surface conductive pad being paired with one of the first surface conductive pads and being electrically connected thereto by way of a conductive via extending through said first head member;

the joined lateral edges of the at least two joined head member sections lying between a last conductive pad in the lengthwise row on a first one of two joined head member sections and a first conductive pad in the lengthwise row on a second one of two joined head member sections; the last and first conductive pads forming a pair of adjacent conductive pads; the center-to-center distance between the adjacent conductive pads occurring at the joined lateral edges being within a predetermined tolerance of the center-to-center distance of a pair of adjacent conductive pads on one of the joined head sections remote from the joined lateral edge; and

a second elongated insulative head member disposed on top of the plurality of conductors, the plurality of first surface conductive pads, and the first head member formed from the at least two joined head member sections; the second head member restraining the plurality of conductors in fixed positions between the first and second head members.

5,815,190

IMAGE FORMING METHOD, IMAGE FORMING APPARATUS AND IMAGE FORMING MEMBER

Katsuyuki Ohshima; Takeshi Ueno; Mineo Yamauchi, and Tatsuya Kita, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Division of Ser. No. 213,558, Mar. 16, 1994, Pat. No. 5,550,099, which is a division of Ser. No. 809,501, Jan. 6, 1992, Pat. No. 5,318,941. This application Jun. 4, 1996, Ser. No. 658,069

Claims priority, application Japan, May 7, 1990, 2-117209; Aug. 4, 1990, 2-207037; Feb. 19, 1991, 3-045382

Int. Cl.[6] B41J *2/325*

U.S. Cl. 347—171 **9 Claims**

6. An image forming apparatus, comprising receiving layer transfer means for forming a receiving layer stainable with sublimation dye on a member to be recorded, sublimation transfer means for forming an image by shifting the sublimation dye from a thermal transfer sheet having a dye layer containing a sublimation dye toward a receiving layer of the member to be recorded,

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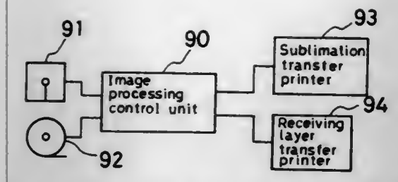


and an image processing control means for outputting image information to the receiving layer transfer means and a sublimation transfer means and for controlling the two transfer means, characterized in that said image processing control means is provided with an image area identifying unit and drives and controls the receiving layer transfer means based on identifying data from the image area identifying unit.

5,815,191
DIRECT THERMAL PRINTING METHOD AND APPARATUS

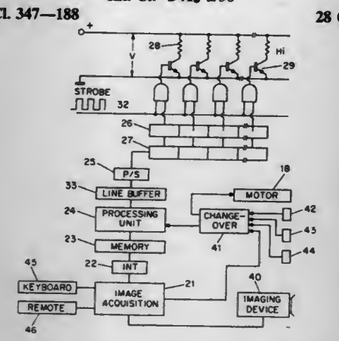
Joseph Michielsen, Edegem; David Tilemans, Lier; Leo Oelbrandt, Kruibeke; Robert Overmeer, Mortsel, and Marc De Clerck, Borsbeek, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Jan. 11, 1996, Ser. No. 584,450

Claims priority, application European Pat. Off., Jan. 31, 1995, 95200237

Int. Cl.[6] B41J *2/36*

U.S. Cl. 347—188 **28 Claims**



1. A method of operating a direct thermal printer for printing medical images on an imaging element, said direct thermal printer having a print head and a variable speed motor, said method comprising the steps of:

receiving medical image data representing said medical images;

processing one or more printing prerequisites provided within said medical image data for controlling heating energy applied to said print head and for controlling the speed of said variable speed drive motor;

generating a control signal using said printing prerequisites for controlling the speed of said variable speed drive motor;

automatically configuring said printer in a plurality of operating modes using said control signal, said printer being capable of operating in at least two modes, including a standard quality operating mode in which said variable speed drive motor is operated at a first speed, and at least one premium quality operating mode in which said variable speed drive motor is operated at a second speed slower than said first speed;

passing said imaging element adjacent said print head by means of said variable speed drive motor; and

heating said print head in accordance with said medical image data and said printing prerequisites to form said medical images on said imaging element.

5,815,192
PRINTING APPARATUS HAVING PRINT HEAD TYPE DETECTION FOR INTERCHANGEABLE AND SELECTIVELY MOUNTED PRINT HEADS HAVING OPPOSITE SCAN DIRECTIONS

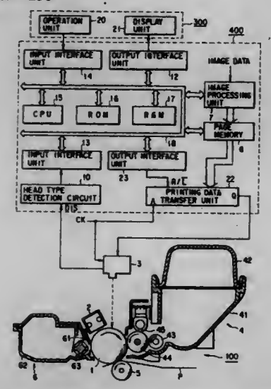
Tetsushi Matsuo, Tachikawa, and Kazuo Matumoto, Ome, both of Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan

Filed Jun. 21, 1996, Ser. No. 667,620

Claims priority, application Japan, Jun. 29, 1995, 7-163797

Int. Cl.[6] B41J *2/45*

U.S. Cl. 347—238 **16 Claims**



9. A printing apparatus in which one of two types of printing heads with opposite scan directions is selectively mounted and the mounted printing head is supplied with printing data representing an image to be printed, thereby printing the image, said printing apparatus comprising:

printing data transfer means for transferring the printing data to the mounted printing head in one of an order from a beginning to an end of a scan line and an order from the end to the beginning of the scan line;

head recognition means for recognizing the type of the mounted printing head; and

transfer control means for enabling the printing data transfer means to transfer the printing data in the order associated with the type of the mounted printing head recognized by the head recognition means.

5,815,193
PRINTING WITH SEALABLE HOUSING AND ADJUSTABLE BACK-UP PLATE AND METHOD THEREFOR

Anthony Lydale Clevinger, Glen Ellyn, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Dec. 3, 1997, Ser. No. 984,461

Int. Cl.[6] B41J *11/14;11/20;29/02*

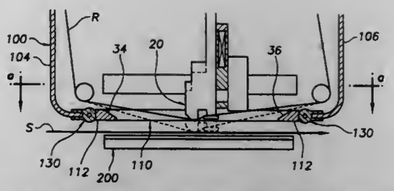
U.S. Cl. 347—222 **20 Claims**

1. A printer system useable for printing onto a substrate, the systems comprising:

a housing;

a print head disposed in the housing;

a print head access opening having a first perimeter on a first side portion of the housing;



an actuatable back-up plate mountably disposed adjacent the print head access opening, the back-up plate movable toward the print head access opening and into engagement with the first perimeter to sealingly close the print head access opening, and the back-up plate movable away from the print head access opening of the housing to a printing position to open the print head access opening,

whereby the print head is sealingly enclosed within the housing when the back-up plate is engaged with the print head access opening thereof.

5,815,194
VIDEO-ON-DEMAND SYSTEM

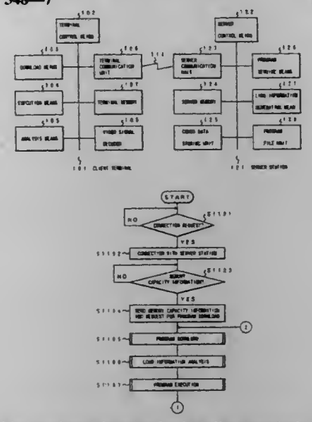
Hiroaki Ueda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 6, 1996, Ser. No. 597,193

Claims priority, application Japan, Feb. 9, 1995, 7-021627

Int. Cl.[6] H04N *7/10*

U.S. Cl. 348—7 **5 Claims**



1. A video-on-demand system having client terminals connected with a server station for delivering video information services to the client terminals through a bi-directional data transmission network, comprising:

a terminal memory provided in each of the client terminals for storing data, including at least one program used for a user's designation of a video information service;

a program sending means provided in the server station for downloading programs and video data, to any one of the client terminals through the bi-directional transmission network, wherein said server station confirms, before downloading, that said one of the client terminals includes a download means, such confirmation being achieved by receiving memory capacity information from said one of the client terminals; and

an executing means provided in each of the client terminals for executing said at least one program and sending a request for a video information service designated by said user to the server station.

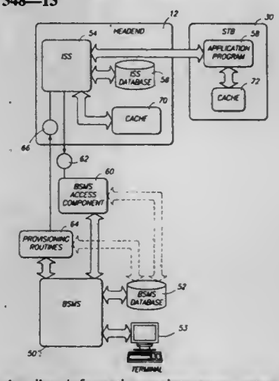
5,815,195
SUBSCRIBER INFORMATION MAINTENANCE SYSTEM AND METHODS

Simon Tam, Issaquah, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed May 6, 1996, Ser. No. 643,332

Int. Cl.[6] H04N *7/14*

U.S. Cl. 348—13 **22 Claims**



1. A subscriber information maintenance system for use in an interactive video entertainment distribution network, comprising:

a subscriber interface device at the premises of an individual subscriber;

a service provider headend connected for video and bi-directional data communications with the subscriber interface device, the service provider beadend providing enhanced services and traditional video programming to the subscriber through the subscriber interface device;

a billing and subscriber management system that maintains a first set of information with billing information regarding individual subscribers and with information regarding traditional video programming provided to such subscribers;

an interactive subscriber services program that maintains a second set of information regarding enhanced services provided to individual subscribers, wherein the second set of information is different than the first set of information;

an interactive application program executing on the subscriber interface device, the interactive application program communicating with the interactive subscriber services program to access and modify specific information items from the first and second sets of information without specifying whether the specific information items are maintained by the billing and subscriber management system or by the interactive subscriber services program;

in response to a request by the interactive application program to reference a specific information item, the interactive subscriber services program referencing the first set of information if the specific information item is part of the first set of information maintained by the billing and subscriber management system, the interactive subscriber services program referencing the second set of information if the specific information item is part of the second set of information maintained by the interactive subscriber services program.

5,815,196
VIDEOPHONE WITH CONTINUOUS SPEECH-TO-SUBTITLES TRANSLATION

Hiyan Alshawi, Millburn, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 29, 1995, Ser. No. 581,666

Int. Cl.[6] H04N *7/14*

U.S. Cl. 348—17 **9 Claims**

1. An apparatus for providing continuous speech-to-subtitle translation of a signal containing a video portion, and an audio portion comprising:

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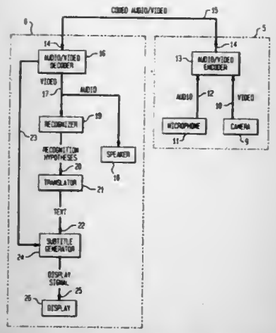
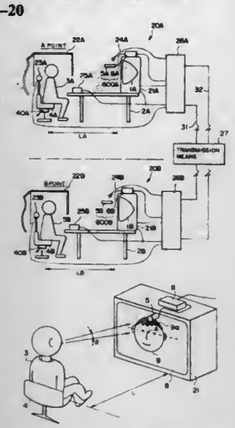


(a) means for converting said audio portion to a corresponding first textual signal, wherein said converting means is located at a sending party's location;
(b) means for translating said corresponding first textual signal to a second textual signal wherein said second textual signal is in a target language and wherein said translating means is located remotely from said sending party's location;
(c) means for combining said video portion with said second textual signal to form a display signal, wherein said display signal displays said second textual signal as subtitles; and
(d) means for simultaneously displaying said display signal and outputting said audio portion.

5,815,197
TWO-WAY INTERACTIVE SYSTEM, TERMINAL EQUIPMENT AND IMAGE PICKUP APPARATUS HAVING MECHANISM FOR MATCHING LINES OF SIGHT BETWEEN INTERLOCUTORS THROUGH TRANSMISSION MEANS

Toshiaki Kakii, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 16, 1996, Ser. No. 606,044
Claims priority, application Japan, Feb. 16, 1995, 7-028061; Aug. 31, 1995, 7-223606
Int. Cl.[6] H04N *7/14*
U.S. Cl. 348—20 **38 Claims**



1. A two-way interactive system comprising a first terminal equipment located at a first point where a first interlocutor is present, a second terminal equipment located at a second point where a second interlocutor is present, and transmission means, arranged between said first terminal equipment and said second terminal equipment, for enabling two-way communication of at least image data of the first interlocutor and the second interlocutor, at least said first terminal equipment comprising:

a display unit for displaying an image of the second interlocutor, which is received through said transmission means, on a monitor;

position regulation means for regulating a position of the first interlocutor with respect to a monitor screen of said display unit; and

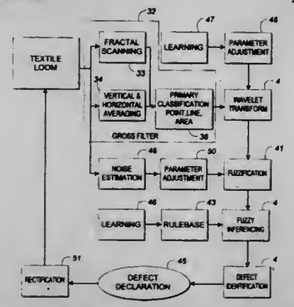
an image pickup apparatus for enabling transmission of an image of the first interlocutor to said second terminal equipment through said transmission means, said image pickup apparatus having an image pickup unit for directly picking up the image of the first interlocutor and a support mechanism for setting said image pickup unit at a predetermined position between the first interlocutor and said monitor while an image pickup direction of said image pickup unit is set directly toward the first interlocutor,

wherein said image pickup unit is set in a predetermined area defined by a distance from said monitor to the first interlocutor, which is specified by said position regulation means, and a predetermined parallactic angle for determining that a line of sight of the first interlocutor matches a line of sight of the monitor image of the second interlocutor.

5,815,198
METHOD AND APPARATUS FOR ANALYZING AN IMAGE TO DETECT AND IDENTIFY DEFECTS

George J. Vachtsevanos, 2040 Dayron Ct., Marietta, Ga. 30062; Muid Mufti, 1041 State St. NW., Apt. 20, Atlanta, Ga. 30318, and J. Lewis Dorrity, 3080 Beechwood Dr., Marietta, Ga. 30067

Filed May 31, 1996, Ser. No. 657,023
Int. Cl.[6] H04N *7/18*
U.S. Cl. 348—88 **24 Claims**



1. An apparatus for analyzing an image to detect and identify defects in an object, said apparatus comprising:

at least one image sensor disposed to capture an image of the object;

a light source for projecting light onto the object;

means for converting the captured image into a digital representation;

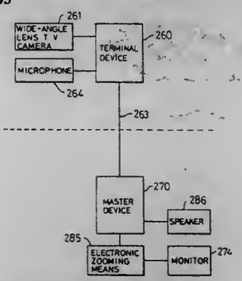
a storage device for receiving the digital representation of the image from said means for converting the captured image and for storing the digital representation; and

processing means for processing the digital representation of the captured image stored in said storage device, wherein the processing comprises a convolution operation on the digital representation whereby one or more wavelets are used to transform the input digital signal into wavelet coefficients thus extracting certain defect feature sets from the digital representation, performing fuzzification by calculating the degree of membership of the extracted feature sets in feature templates stored in a knowledge base in said storage device in accordance with a similarity function, generating fuzzy sets from said defect feature sets if their degree of membership exceeds a threshold, and performing fuzzy inferencing with said rules and fuzzy sets to classify the type of defect that has occurred.

5,815,199
INTERPHONE WITH TELEVISION

Stephen Ray Palm; Satoshi Furukawa, and Kenichi Hagio, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 151,776, Nov. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 827,988, Jan. 29, 1992, abandoned. This application Jan. 26, 1996, Ser. No. 592,442
Claims priority, application Japan, Jan. 31, 1991, 3-010695; Jul. 31, 1991, 3-191730
Int. Cl.[6] H04N *7/18*
U.S. Cl. 348—143 **2 Claims**



1. An interphone with a television comprising:

a terminal device including wide-angle lens means for monitoring a visitor at an entrance, means for generating a real-time moving image covering an image area monitored, and output means for outputting an image signal including a plurality of horizontal lines carrying the real-time moving image; and

a master device interconnected with the terminal device and including

analog-to-digital converting means receiving the image signal from the output means of the terminal device for converting the image signal into a digitized image signal including a plurality of horizontal lines, each line including a plurality of picture elements,

distortion correcting means for digitally correcting distortion only in the picture elements of each horizontal line of the digitized image signal due to the wide-angle lens means, the distortion correcting means including

buffer memory means receiving and storing respective picture elements for a horizontal line of the digitized image signal from the analog-to-digital converting means,

interpolation means for processing sequentially the respective picture elements for the horizontal line, except for the picture elements at beginning and terminating ends of the line, interpolating the picture elements between both ends, thereby producing an interpolated picture element for each picture element in the horizontal line, and

one-line buffer memory means receiving and storing the interpolated picture element,

digital-to-analog converting means receiving from the one-line buffer memory means the corrected horizontal line data and from the analog-to-digital converting means vertical line data of the image signal for producing a corrected analog image signal,

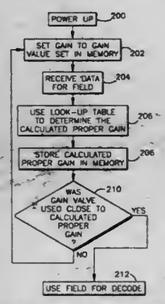
a monitor receiving the corrected analog image signal and reproducing the real-time moving image, and

scroll means coupled to the analog-to-digital converting means and the distortion correcting means for scrolling the real-time moving image on the monitor.

5,815,200
EXTENDED WORKING RANGE DATAFORM READER WITH REDUCED POWER CONSUMPTION

Paul P. Ju, and Ynjiun P. Wang, both of Ft. Myers, Fla., assignors to Metanetics Corporation, Ft. Myers, Fla.

Continuation-in-part of Ser. No. 494,435, Jun. 26, 1995, Pat. No. 5,811,784, Ser. No. 332,592, Oct. 31, 1994, Pat. No. 5,521,366, and Ser. No. 280,489, Jul. 26, 1994, Pat. No. 5,572,006. This application Jul. 25, 1995, Ser. No. 507,607
Int. Cl.[6] H04N *5/235*
U.S. Cl. 348—229 **23 Claims**



15. A two dimensional imaging based dataform reader module configured for use in a dataform reader, the reader module comprising:

a camera assembly including an image sensor configured to detect a reflected image of an illuminated region including a dataform;

an illumination module configured to illuminate a dataform to be detected by the camera assembly;

a control board including a microprocessor to which the camera assembly and illumination module are operatively coupled;

gain control circuitry realized on the control board, the gain control circuitry comprising an open loop gain control system configured to set a gain value to a gain setting used during a previous dataform reading session in response to power up and incrementally adjust the gain value after evaluation of image data to achieve a gain corrected video signal within a short latency period; and

image processing circuitry operative to decode the detected dataform image.

5,815,201
METHOD AND SYSTEM FOR READING AND ASSEMBLING AUDIO AND IMAGE INFORMATION FOR TRANSFER OUT OF A DIGITAL CAMERA

Tetsuya Hashimoto, Ichikawa, and Hiroki Fukuoka, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 603,583
Claims priority, application Japan, Feb. 21, 1995, 7-032589; Feb. 21, 1995, 7-032595; Feb. 28, 1995, 7-040136; Feb. 28, 1995, 7-040139; Aug. 17, 1995, 7-209724
Int. Cl.[6] H04N *5/76*
U.S. Cl. 348—232 **26 Claims**

11. A system for transferring information, comprising:

an electronic camera including:

a lens;

a light sensor for sensing images through the lens;

a microphone for sensing audio;

a memory for storing image information obtained by the light sensor, audio information obtained by the microphone, and information describing a relationship between the image information and the audio information;

means for reading, from the memory of the camera, the information describing the relationship between the image information and the audio information;

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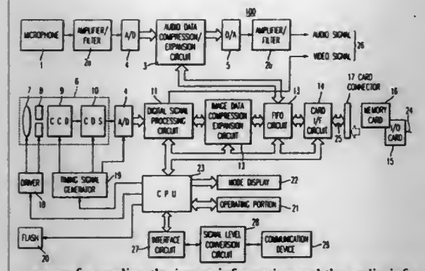


means for reading the image information and the audio information, using the information describing the relationship; and

a transmitter which transmits out of the electronic camera, the image information and the audio information without the information describing the relationship, and

an external device which is external to the camera and connected to the camera, including;

a memory;

a receiver which receives the image information and the audio information;

means for writing the image information and the audio information in the memory of the external device; and

means for writing information, in the memory of the external device, describing the relationship between the image information and the audio information.

5,815,202

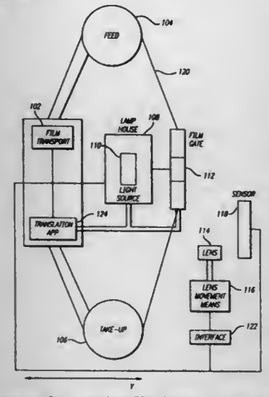
METHOD AND APPARATUS FOR SCANNING AN IMAGE USING A MOVING LENS SYSTEM

David Difrancesco, San Francisco, Calif., assignor to Pixar, Richmond, Calif.

Filed Jun. 11, 1996, Ser. No. 664,266

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—97 **18 Claims**



1. An apparatus for scanning film images comprising:

film transport means for moving film at a controlled speed;

a lens;

a sensor for converting projected images into signals;

said sensor having a sensor surface;

said sensor converting light that strikes said sensor surface into signals;

a light source for projecting an image through said lens;

said lens positioned between said light source and said sensor;

lens movement means for moving said lens relative to said sensor in a plane substantially parallel to said sensor surface so as to move a projected image across said sensor surface;

said lens mechanically coupled to said lens movement means.

5,815,203

ZOOM TRACKING APPARATUS AND METHOD IN A VIDEO CAMERA

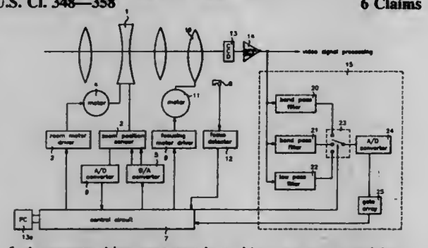
Seoung Eog Lee, and Jin Soo Park, both of Kyungki-do, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 246,213, May 19, 1994, abandoned. This application Oct. 5, 1995, Ser. No. 540,238

Claims priority, application Rep. of Korea, May 20, 1993, 1993/8701; May 21, 1993, 1993/8819

Int. Cl.[6] H04N *5/232*

U.S. Cl. 348—358 **6 Claims**



1. A zoom tracking apparatus in a video camera, comprising:

a zoom lens for changing the image size of an object;

a focusing lens for focusing the image of the object;

photoelectric conversion means for converting an optical image of said object produced by the zoom lens and the focusing lens into an output video signal;

evaluation value detection means for detecting a focus evaluation value of the output video signal from the photoelectric conversion means;

position detection means for detecting a position of the zoom lens and a position of the focusing lens; and

control circuit means for storing zoom tracking curve data containing a relative position between the detected zoom lens position and the detected focusing lens position and controlling a position of the focus lens using zoom lens position information corresponding to a maximum focus evaluation value and the stored zoom tracking curve data, wherein, of the portion of the zoom tracking curve data in a wide region that includes curve traces that extend into a tele region, the control circuit means stores only the zoom-tracking curve data corresponding to a maximum object distance and a minimum object distance, and stores all of the zoom tracking curve data in the tele region.

5,815,204

STROBE APPARATUS OF A STILL VIDEO CAMERA WITH ADJUSTABLE COLOR TEMPERATURE

Tetsuya Abe, and Kimiaki Ogawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 317,867, Oct. 4, 1994, abandoned. This application Apr. 8, 1997, Ser. No. 827,709

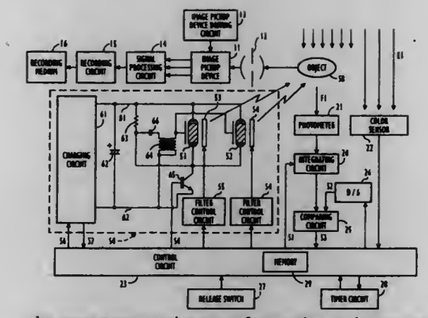
Claims priority, application Japan, Oct. 4, 1993, 5-271298

Int. Cl.[6] H04N *5/222*

U.S. Cl. 348—371 **40 Claims**

1. A strobe apparatus of a still video camera having an image pickup device comprising:

light emitting means for emitting strobe light toward an object to be photographed;



color temperature metering means for metering a color temperature of the ambient light reflected from said object;

emitting control means for varying a color temperature of said strobe light in accordance with said color temperature of the ambient light, so that said color temperature of said object is substantially identical to a predetermined value corresponding to a specific spectral sensitivity of said image pickup device;

said light emitting means comprising first and second light emitting tubes which emit different color temperatures of strobe light; and

monochrome liquid crystal filters provided in front of said first and second light emitting tubes to control a quantity of light transmitted by said first and second light emitting tubes.

5,815,205

EXTERNAL COMMUNICATION INTERFACE FOR A DIGITAL CAMERA

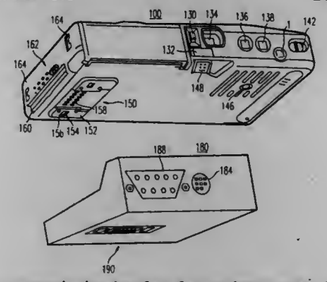
Tetsuya Hashimoto, Ichikawa; Hiroki Fukuoka, and Takashi Ohkuma, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 603,551

Claims priority, application Japan, Feb. 21, 1995, 7-032589; Feb. 21, 1995, 7-032595; Feb. 28, 1995, 7-040136; Feb. 28, 1995, 7-040139; Aug. 17, 1995, 7-209724

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—373 **24 Claims**



1. A communication interface for use between an electronic camera and an electronic device, the electronic device being separate from the electronic camera, comprising:

a housing;

a mechanical connector, attached to the housing, which detachably connects the housing to the electronic camera;

a plurality of electrical connectors which communicate electrical signals between the communication interface and the electronic camera;

an electrical interface which communicates electrical signals between the communication interface and the electronic device; and

circuitry, connected between the plurality of electrical connectors and the electrical interface, which changes a level of signals communicating between the electronic camera and the electronic device,

wherein;

the electronic camera includes a microprocessor which operates using signals having a low level of approximately zero volts and a high level greater than zero volts and less than or equal to approximately five volts; and

the circuitry which changes the level of signals converts signals having the low level from the electronic camera to a signal between approximately −15 volts and −5 volts, and converts signals from the electronic camera having the high level to a signal between approximately +5 and +15 volts.

5,815,206

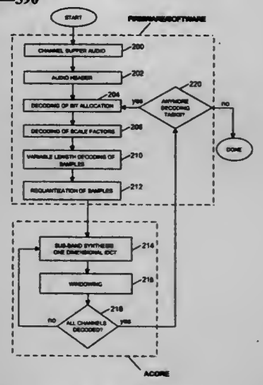
METHOD FOR PARTITIONING HARDWARE AND FIRMWARE TASKS IN DIGITAL AUDIO/VIDEO DECODING

Srinivasa R. Malladi, San Jose; Marc A. Miller, Palo Alto, and Kwok K. Chau, Los Altos, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed May 3, 1996, Ser. No. 643,185

Int. Cl.[6] H04N *7/36;7/50*

U.S. Cl. 348—390 **24 Claims**



11. A video decoder for decoding video data contained in a bitstream, the video decoder comprising:

a) firmware or software for implementing, in conjunction with a CPU, video header processing functions, audio and video synchronization, and preparsing functions; and

b) hardware for implementing preparsing assist, macroblock reconstruction, and video display control functions, and the preparsing assist functions implemented as hardware include one or more of byte alignment and start code detection, writing to a start code table, and a buffer management for the bitstream.

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5,815,207

DIFFERENTIAL CODING AND DECODING METHOD AND RELATED CIRCUITS

Silvio Cucchi, Gaggiano, and Maurizio Lazzer, Zoppola, both of Italy, assignors to Alcatel N.V., Rijswijk, Netherlands

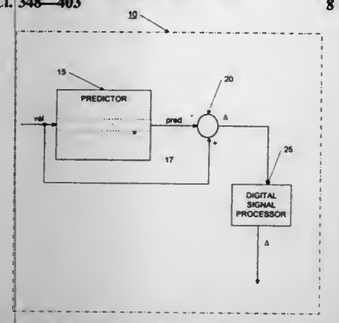
PCT No. PCT/EP94/01360, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO94/26068, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 29, 1994, Ser. No. 537,796

Claims priority, application Italy, Apr. 29, 1993, MI93A0844

Int. Cl.[6] H04N *7/30*

U.S. Cl. 348—403 **8 Claims**



1. A method for coding a video signal comprising the steps of:

considering blocks of X rows and Y columns of said video signal;

calculating the bidimensional Discrete Cosine Transform of said blocks;

predicting the transform coefficients of the first column of each transformed block;

carrying out a difference between the true value of each of said transform coefficients and the predicted value of each of said transform coefficients if said true value is different from zero; and characterised by

predicting said transform coefficients of the first column of each transformed block using coefficients of further columns of said transformed block and coefficients of a preceding transformed block;

coding said difference by associating more probable difference values to smaller numbers, thereby maintaining said numbers within the initial range of said true value; and

coding the true value of said transform coefficient as such if said true value is equal to 0.

5,815,208

VGA TO NTSC CONVERTER AND A METHOD FOR CONVERTING VGA IMAGE TO NTSC IMAGES

Francis M. Samela, Lombard, and Joseph R. Llorens, Winfield, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Dec. 9, 1994, Ser. No. 353,094

Int. Cl.[6] H04N *7/01*

U.S. Cl. 348—446 **23 Claims**

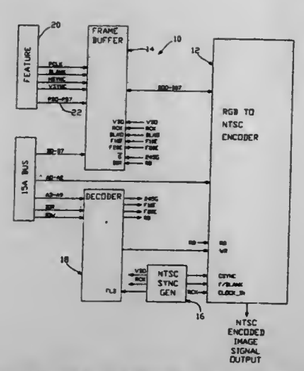
1. A system for converting non-interlaced VGA image data to interlaced encoded image signals, the system comprising:

means for detecting an identifiable mode of the non-interlaced VGA image data;

means for storing non-interlaced VGA image data as data within a plurality of field memory areas wherein pixel data from even numbered scan lines and pixel data from odd numbered scan lines are stored in separate field memory areas;

means for controlling operatively connected to the means for storing; and

means for filtering the data in the field memory areas so that pixel data from the field memory area storing even numbered scan lines, and pixel data from the field memory location



storing odd numbered scan lines, are read alternately for each pixel in each output scan line so that reduced flicker interlaced encoded image signals are produced from the data within the field memory areas.

5,815,209

ENCODING METHOD, AN ENCODING APPARATUS, A DECODING METHOD AND A DECODING APPARATUS FOR A MOVING PICTURE

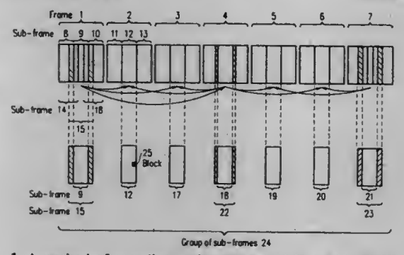
Satoshi Kondo, Sakai; Yoshinari Takemura, Settsu; Ryoji Yamaguchi, Katano, and Hiroyuki Suzuki, Matsubara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 336,511, Nov. 9, 1994, abandoned. This application May 12, 1997, Ser. No. 854,758

Claims priority, application Japan, Nov. 9, 1993, 5-279514; Apr. 21, 1994, 6-083087

Int. Cl.[6] H04N *7/30*

U.S. Cl. 348—403 **14 Claims**



1. A method of encoding a picture, comprising the steps of:

receiving the picture and dividing the picture into N sub-pictures, N being an integer equal to or larger than 2, wherein at least one of the N sub-pictures overlaps another one of the N sub-pictures to define an overlapping region;

generating a header related to a hierarchical level of picture or higher levels;

encoding the N sub-pictures and generating N code sequences corresponding to the respective N sub-pictures, wherein the N code sequences are N sets of transform coefficients and the N sets of transform coefficients include overlapping coefficients corresponding to the overlapping region;

adding the header to one of the N code sequences; and

generating a code sequence corresponding to the picture by combining the N code sequences together at a portion corresponding to a boundary between the N sub-pictures and a boundary between continuous pictures in terms of time,

wherein an order of the combined code sequences is equal to an order of code sequences obtained by encoding the picture without dividing the picture.

5,815,210

Patent Not Issued For This Number

5,815,211

IMAGE PROCESSING SYSTEM AND METHOD FOR OUTPUTTING A SUPERPOSED VIDEO SIGNAL INCLUDING VIDEO AND INFORMATION

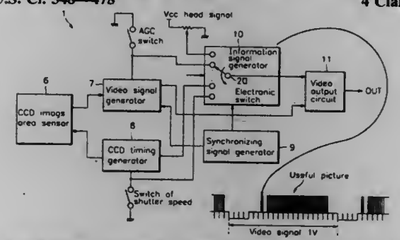
Sachio Umei, Tokyo, Japan, assignor to Samsung Aerospace Industries, Ltd., Kyungsangnam, Rep. of Korea

Filed Feb. 14, 1996, Ser. No. 601,564

Claims priority, application Japan, Feb. 15, 1995, 7-026349

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—478 **4 Claims**



1. An image processing system for outputting a video signal, comprising:

a processor for processing the video signal for output to a video input of a TV monitor;

a detector to detect an information signal of a CCD camera; and

outputting means for superposing the information signal on the video input during vertical fly-back of a horizontal scanning spot of the TV monitor.

5,815,212

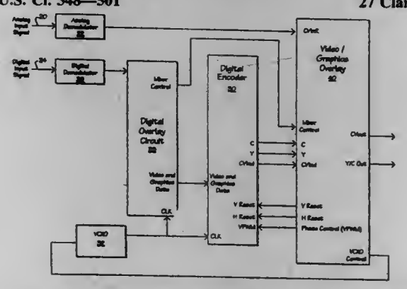
VIDEO OVERLAY CIRCUIT FOR SYNCHRONIZING AND COMBINING ANALOG AND DIGITAL SIGNALS

Steve Edwards; Duc Ngo, both of San Jose, and Mehrdad Nayebi, Palo Alto, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 11, 1996, Ser. No. 585,105

Int. Cl.[6] H04N *5/04*

U.S. Cl. 348—501 **27 Claims**



1. A video display system configured for receiving an analog input composite video signal having a first phase and a first frequency, and a digital input composite video signal having a second phase and a second frequency, the video display system comprising:

a. an automatic phase and frequency correction circuit configured to receive the analog input composite video signal and the digital input composite video signal for monitoring the first phase, the second phase, the first frequently and the second frequency and ensuring that the second phase and the second frequency are equal to the first phase and the first frequency, wherein the analog composite video signal is a master signal and is not adjusted and the digital input composite video signal is a slave signal and is adjusted so that the second phase equals the first phase and the second frequency equals the first frequency; and

b. a mixer circuit configured to receive the analog input composite video signal, the digital input composite video signal and one or more control signals for generating the output composite video signal representing a predetermined ratio of the analog input composite video signal and the digital input composite video signal, wherein the mixer circuit receives the analog input composite video signal and a respective analog ground reference signal for generating a differential analog signal and the digital input composite video signal and a respective digital ground reference signal for generating a differential digital signal.

5,815,213

VIDEO SIGNAL SYNCHRONIZATION EXTRACTION DEVICE

Thierry Meunier, Pommiers la Placette, France, assignor to Thomson multimedia S.A., Courbevoie, France

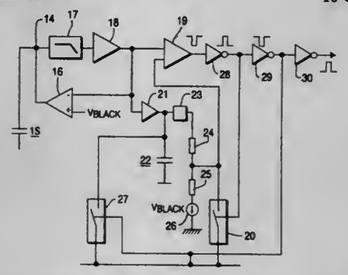
PCT No. PCT/FR94/00658, § 371 Date Apr. 2, 1996, § 102(e) Date Apr. 2, 1996, PCT Pub. No. WO94/30005, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 3, 1994, Ser. No. 553,616

Claims priority, application France, Jun. 8, 1993, 93 06834

Int. Cl.[6] H04N *5/08*

U.S. Cl. 348—533 **10 Claims**



1. Device for extracting synchronization from a video signal including dual-threshold synchronization pulse detection means wherein the detection thresholds are proportional to the amplitude of the synchronization pulses,

the amplitude of the synchronization pulses is represented by a voltage stored by an amplitude detector in a storage capacitor,

a sample-and-hold means for bringing back a voltage stored in the storage capacitor to a voltage corresponding to a synchronization pulse, when a synchronization pulse is detected,

said sample-and-hold means creating a second current counter to first current which the amplitude detector creates in order to modify the voltage of the capacitor,

the current created by the amplitude detector is of greater strength in absolute value than the current created by the sample-and-hold means.

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5,815,214

OSCILLATORY SIGNAL GENERATOR ARRANGEMENT

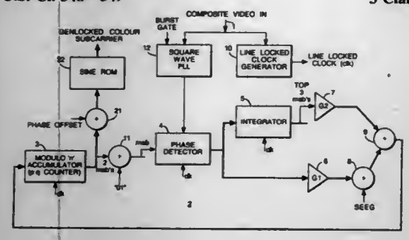
Gareth Robert Williams, Wiltshire, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Dec. 4, 1995, Ser. No. 566,976

Claims priority, application United Kingdom, Dec. 9, 1994, 9424839

Int. Cl.[6] H04N *9/44;* **H03L** *7/00*

U.S. Cl. 348—549 **3 Claims**



1. An oscillatory signal generator for generating a color subcarrier signal having a period for digitally generated video signals, for use in an arrangement in which images represented by said digitally generated video signals are to be displayed substantially in synchronism with images represented by incoming television video signals having a line frequency, said oscillatory signal generator comprising: a digital phase locked loop which is arranged to be clocked by clock signals locked in frequency to the line frequency of said incoming video signals, said phase locked loop including a digital accumulator; means for adding an incremental digital value to a count registered by said accumulator such that said count follows a periodic sawtooth waveform having a phase and a period which determines the period of said color subcarrier signal, said period of the waveform being dependent upon a maximum count of said accumulator and upon said incremental digital value; phase comparator means for comparing the phase of said periodic sawtooth waveform with a phase of a reference waveform derived from said incoming video signals; and means for deriving said incremental digital value as a sum of a seed value, a value proportional to an instantaneous value of an output signal of said phase comparator means, and a value proportional to an integral of the output signal of said phase comparator means.

5,815,215

APPARATUS FOR CONTROLLING THE LUMINANCE OF VIDEO SIGNALS IN CHARACTER AREAS ON AN ON-SCREEN-DISPLAY

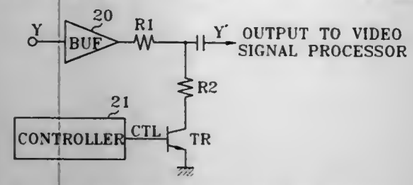
Ye-mok Yang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 30, 1996, Ser. No. 689,051

Claims priority, application Rep. of Korea, Jul. 31, 1995, 95-23464

Int. Cl.[6] H04N *5/445*

U.S. Cl. 348—569 **6 Claims**



1. A video signal luminance control apparatus, comprising:

an input portion for receiving a luminance signal of the video signal and for outputting the luminance signal;

a resistor having a first end connected to the output of said input portion;

a transistor having a collector connected to the second end of said resistor to receive the luminance signal output from said input portion; and

a controller connected to the base of said transistor for outputting a control signal for controlling the on/off operation of said transistor based on whether an on-screen display (OSD) character is to be displayed.

5,815,216

DISPLAY DEVICE CAPABLE OF DISPLAYING EXTERNAL SIGNALS AND INFORMATION DATA USING A DOUBLE-PICTURE TYPE SCREEN

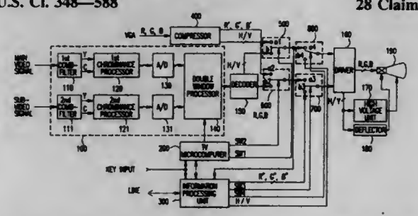
Moon-hwan Suh, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 15, 1996, Ser. No. 680,045

Claims priority, application Rep. of Korea, Sep. 14, 1995, 95-30379

Int. Cl.[6] H04N *5/45*

U.S. Cl. 348—588 **28 Claims**



1. A display device capable of displaying a first video signal and a second video signal on a display of a double-picture type screen, said device comprising:

a double window processing unit for processing said first video signal and said second video signal to be displayed on said double-picture type screen, wherein said double window processing unit outputs a television video signal and first horizontal and vertical synchronization signals which correspond to at least one of said first video signal and said second video signal;

information processing means for receiving information data from a value added network, wherein said information processing means outputs an information video signal relating to said information data, generates second horizontal and vertical synchronization signals corresponding to said information video signal, and outputs first and second switching control signals;

first switching means for selectively outputting either said television video signal or said information video signal as a selected video signal in accordance with said first switching control signal;

second switching means for selectively outputting either said first horizontal and vertical synchronization signals or said second horizontal and vertical synchronization signals as selected synchronization signals in accordance with said second switching control signal; and

display control means for causing said selected video signal to be displayed on said display in accordance with said selected synchronization signals.

5,815,217

SCENE-CHANGE DETECTOR FOR A MOVING IMAGE COMPOSED OF A PLURALITY OF FRAMES

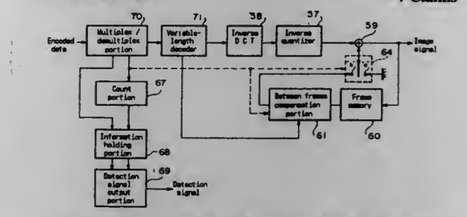
Hiroyuki Kumazawa, and Minoru Ozaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 24,739, Mar. 1, 1993, abandoned. This application Jan. 22, 1997, Ser. No. 787,449

Claims priority, application Japan, Mar. 6, 1992, 4-083049; May 7, 1992, 4-141089; Dec. 9, 1992, 4-351615

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—700 **4 Claims**



1. A scene-change detector for detecting a scene-change of a moving image composed of a plurality of frames, comprising,

a means for determining an encoding mode of encoded data of each of a plurality of split areas from among a plurality of potential encoding modes, said split areas dividing each of said plurality of frames of said moving image;

a means for counting a number of occurrences of each of said plurality of encoding modes of the encoded data;

a means for determining a frame mode for each frame from among a plurality of frame modes, each of the plurality of frame modes being defined by a set of the plurality encoding modes which are used for encoding split areas in a frame of the frame mode ;

a means for storing data of said number of occurrences of each encoding mode and data of corresponding frame modes for at least two frames; and

a means for outputting a signal showing a scene-change when said stored number of occurrences and said stored corresponding frame modes are in accordance with one of a plurality of a predetermined conditions.

5,815,218

CIRCUIT DEVICE INCLUDING RF CONVERTER, TUNER AND IF AMPLIFIER

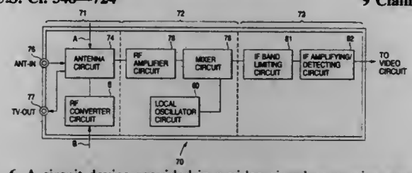
Osamu Maeda, Daito, Japan, assignor to Funai Electric., Ltd, Osaka, Japan

Filed Jan. 4, 1996, Ser. No. 582,625

Claims priority, application Japan, Jan. 4, 1995, 7-000312 U; Apr. 14, 1995, 7-004430 U

Int. Cl.[6] H04N *5/40;5/50*

U.S. Cl. 348—724 **9 Claims**



6. A circuit device provided in a video signal processing apparatus, said circuit device comprising:

a tuner for tuning a television signal;

an IF amplifier for demodulating the television signal;

an RF converter having an RF oscillator for modulating video and audio signals into a television signal in a UHF band; and

a circuit comprising a resonance circuit including a coil and a capacitor for controlling an oscillation frequency of the RF oscillator and a trimmer capacitor for varying a parameter of said resonance circuit to vary the oscillation frequency.

5,815,219

LARGE SCREEN VIDEO DISPLAY SYSTEM AND TELEVISION RECEIVER

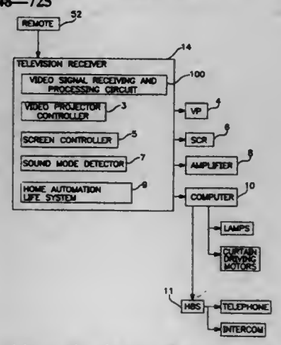
Kiyoshi Okuizumi, Sapporo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1994, Ser. No. 317,126

Claims priority, application Japan, Dec. 22, 1993, 5-324915

Int. Cl.[6] H04N *5/06;9/06*

U.S. Cl. 348—725 **10 Claims**



10. A television receiver for use with a controller for providing a plurality of command signals comprising:

receiving and processing means contained in said television receiver for selectively processing a video signal and outputting said video signal responsive to at least one of the plurality of command signals to said video projector;

video projector control means contained in said television receiver for selectively providing a projector control signal to a video projector responsive to at least one of the plurality of command signals to control the operation of said video projector; and

screen control means contained in said television receiver for selectively providing a screen control signal to a screen responsive to at least one of the plurality of command signals to permit or prevent display of an image from said video projector on said screen,

wherein at least two of:

i) said video signal

ii) said projector control signal and

iii) said screen control signal

are generated in response to one command signal of said plurality of command signals from said controller.

5,815,220

COLOR DEMODULATION FOR DIGITAL TELEVISION

Stephen W. Marshall, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1996, Ser. No. 706,102

Int. Cl.[6] H04N *5/213*

U.S. Cl. 348—727 **20 Claims**

17. A digital television receiver of a video signal having a quadrature-modulated subcarrier signal for color difference information, comprising:

a signal interface that receives and tunes said video signal;

a sampling and color separation unit having:

an analog-to-digital converter that samples said video signal at a sampling frequency such that an integer number of samples are acquired in a time equal to an integer number,

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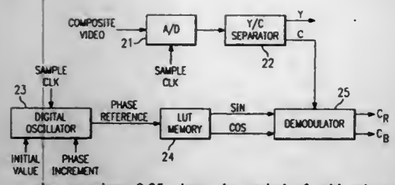


plus or minus 0.25, times the period of said subcarrier signal, thereby providing sampled video data;

a digital luminance-chrominance separator receives said sampled video data and separates said sampled video data into luminance data and chrominance data;

a digital oscillator that provides phase reference values at said sampling frequency, said phase reference values each representing a phase relationship between a chrominance sample and said subcarrier signal, such that each sample of said chrominance data has an associated phase reference value;

a memory that stores sin and cosine values and matches said phase reference values to said sin and cosine values; and

a demodulator that receives said sin and cosine values and said chrominance data, multiplies each chrominance sample by a sin or a cosine value, and low pass filters the product, thereby providing color difference data;

a pixel processor that receives said luminance data and said chrominance data and performs pixel processing tasks on said data; and

a frame memory that provides said data to a display.

5,815,221

PROJECTOR APPARATUS

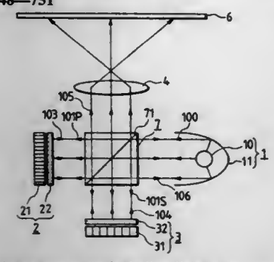
Masanori Kojima; Ko Nishino, both of Kyoto; Yasuhito Myoi, Hyogo; Masaaki Tanaka, Hyogo; Teruo Miyamoto, Hyogo; Fumio Suzuki, Kyoto; Fumio Itoh, Kyoto, and Yoshisuke Otsuru, Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1995, Ser. No. 565,249

Claims priority, application Japan, Dec. 1, 1994, 6-298462

Int. Cl.[6] H04N *9/31*

U.S. Cl. 348—751 **14 Claims**



1. A projector apparatus including light source means for emitting white light, light collecting means for collecting emergent light from said light source means, video-signal light modulating means for subjecting emergent light from said light collecting means to optical modulation in accordance with inputted video signals, and projecting means for enlarging and projecting image light from said video-signal light modulating means onto a display screen,

wherein said video-signal light modulating means comprises luminance-signal light modulating means and chrominance-signal light modulating means for modulating a polarization state of the light in accordance with a luminance signal and chrominance signals, respectively, of the inputted video signals,

said projector apparatus comprising:

first light distributing means for distributing the emergent light from said light collecting means to said luminance-signal light modulating means and said chrominance-signal light modulating means; and

first light combining means for combining modulated light beams from said luminance-signal light modulating means and said chrominance-signal light modulating means,

wherein said first light distributing means and said first light combining means are constituted of polarizing optical means for separating natural light into polarized light beams of a plurality of polarization states or combining the light beams of the plurality of polarization states, and

wherein said luminance-signal light modulating means and said chrominance-signal light modulating means are constituted of transmission-type light modulating means or reflection-type light modulating means, and wherein a component, not contributing to image formation, of light transmitted through or reflected by said luminance-signal light modulating means or said chrominance-signal light modulating means is guided to at least one of said chrominance-signal light modulating means and said luminance-signal light modulating means by using second light distributing means constituted of polarizing optical means.

5,815,222

APPARATUS FOR DEFLECTING LIGHT, DEVICE FOR SCANNING LIGHT, DEVICE FOR READING INFORMATION AND DEVICE FOR STEREOSCOPIC DISPLAY

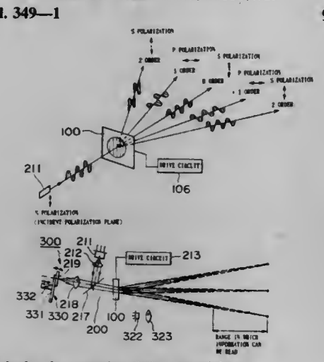
Takahiro Matsuda; Shin Eguchi; Yoshihiro Mizuno; Masato Nakashima; Manabu Ishimoto; Hirokazu Aritake, and Noriko Sato, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1995, Ser. No. 405,602

Claims priority, application Japan, Mar. 18, 1994, 6-049566; Mar. 18, 1994, 6-087124; Mar. 29, 1994, 6-059597

Int. Cl.[6] G02F *1/139;1/1335;1/29*

U.S. Cl. 349—1 **9 Claims**



1. A devise for scanning light comprising:

(a) at least one apparatus for deflecting light having a pair of transference electrodes arranged facing one another, and a liquid crystal inserted between said transference electrodes, thereby forming, when a voltage is applied between said transference electrodes, parallel stripes which function as a diffraction grating at a pitch corresponding to a value of the voltage;

(b) a drive circuit for applying a voltage between said transference electrodes of said apparatus for deflecting light, a value of said voltage changing as time elapsed;

(c) a light source beaming a light to be incident onto said apparatus for deflecting light at an incident angle substantially equal to a diffraction angle of one of a plurality of beams of diffracted light emitted from said apparatus for deflecting light; and

(d) a condensing optical element installed on a incident side or an emitting side of said apparatus for deflecting light; and

(e) changing means for changing a distance along a light axis from the light source to the condensing optical element.

5,815,223

DISPLAY DEVICE HAVING A SILICON SUBSTRATE, A LOCOS FILM FORMED ON THE SUBSTRATE, A TENSILE STRESS FILM FORMED ON THE LOCOS FILM, AND TFTS FORMED ON THE TENSILE STRESS FILM

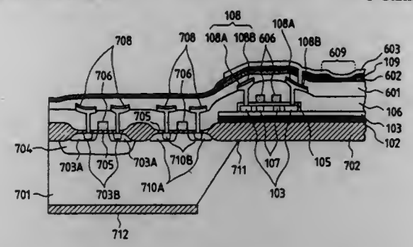
Takanori Watanabe, Atsugi; Mamoru Miyawaki, Isehara; Shunsuke Inoue, Yokohama, and Tetsunobu Kochi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,710, Jun. 19, 1995, abandoned. This application Sep. 30, 1997, Ser. No. 940,944

Claims priority, application Japan, Jun. 20, 1994, 6-137319; Jun. 20, 1994, 6-137320; Jun. 20, 1994, 6-137321

Int. Cl.[6] G02F *1/136;1/1333;* **H01L** *23/58*

U.S. Cl. 349—42 **8 Claims**



1. A display device having a display area in which plural pixels are arranged and a peripheral portion comprising:

a silicon substrate;

a LOCOS oxide film formed on at least a portion of said silicon substrate corresponding to the display area by oxidizing a surface of said silicon substrate;

a film having tensile stress formed on said LOCOS oxide film;

plural thin film transistors formed on said film having tensile stress, corresponding to the plural pixels;

plural pixel electrodes electrically connected with said plural thin film transistors;

an opposite substrate located face to face with said silicon substrate; and

a liquid crystal held between said silicon substrate and said opposite substrate,

wherein said silicon substrate is partially removed at said display area.

5,815,224

LIQUID CRYSTAL DISPLAY DEVICE HAVING VIDEO SIGNAL DRIVING CIRCUIT MOUNTED ON ONE SIDE

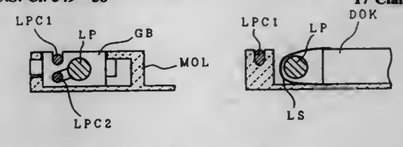
Kaoru Hasegawa, Ichinomiya-machi; Yoshio Toriyama, Nagara-machi; Naoto Kobayashi, Mobara; katsuhiko Yarita, Mobara; Hironori Kondo, Mobara; Masahiko Suzuki, Mobara, and Yoshihiro Imajo, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Chiba-ken, both of Japan

Continuation of Ser. No. 780,237, Jan. 8, 1997, which is a continuation of Ser. No. 419,000, Apr. 7, 1995, Pat. No. 5,640,216. This application Mar. 12, 1997, Ser. No. 816,145

Claims priority, application Japan, Apr. 13, 1994, 6-075019; Apr. 13, 1994, 6-75038; Apr. 13, 1994, 6-075056; Apr. 13, 1994, 6-075063; Apr. 13, 1994, 6-075072

Int. Cl.[6] G02F *1/1333;1/1335;1/1345*

U.S. Cl. 349—58 **17 Claims**



1. A liquid crystal display device comprising:

a liquid crystal display panel sealing a liquid crystal between two superposed transparent glass substrates,

a plurality of circuit substrates arranged at the two, three or four sides of the peripheral portion of said liquid crystal display panel,

a light guide plate for a back light arranged with respect to said liquid crystal display panel,

a metallic shield casing for accommodating said liquid crystal display panel and said circuit substrates,

and a lower casing monolithically molded for accommodating said back light, said metallic shield casing and said mold casings being united by fitting individual fitting members thereof;

wherein said liquid crystal display panel is formed with a single plate portion disposed at a side of said liquid crystal display panel where no circuit substrate is arranged so that said liquid crystal display panel and said light guide plate are held through an elastic member between said single plate portion and said light guide plate and fixed in said device.

5,815,225

LIGHTING APPARATUS FOR A PORTABLE COMPUTER WITH ILLUMINATION APERTURES

Richard F. Nelson, Butte, Mont., assignor to Gateway 2000, Inc., North Sioux City, S. Dak.

Filed Jan. 22, 1997, Ser. No. 786,268

Int. Cl.[6] G02F *1/1335;1/1333;1/13*

U.S. Cl. 349—665 **10 Claims**

1. A lighting apparatus for illuminating a keyboard on a lap top computer, comprising:

a light source for backlighting a liquid crystal display screen, said light source including a light distribution medium;

a liquid crystal display case, the liquid crystal display case having at least one illumination aperture therein; and

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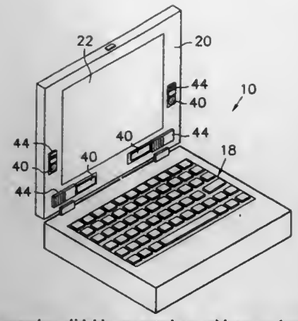


a door member slidably mounted on said screen body for covering said illumination apertures, said door member being adjustably mounted thereon.

5,815,226

ELECTRO-OPTICAL DEVICE AND METHOD OF FABRICATING SAME

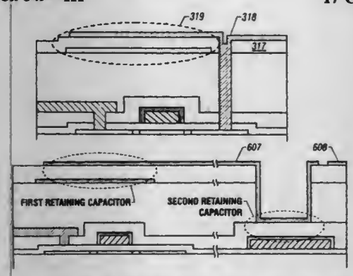
Shunpei Yamazaki, Tokyo; Jun Koyama; Naoaki Yamaguchi, both of Kanagawa; Katunobu Awane, Nara; Fumiaki Funada, Nara, and Yoshitaka Yamamoto, Nara, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Feb. 28, 1997, Ser. No. 808,453

Claims priority, application Japan, Feb. 29, 1996, 8-071074; Oct. 7, 1996, 8-286036

Int. Cl.[6] G02F *1/1333;1/1343*

U.S. Cl. 349—111 **17 Claims**



1. An electro-optical device having gate lines and data lines arranged in rows and columns on a common substrate, pixel electrodes disposed at intersections of the gate lines and data lines, and TFTs connected with the pixel electrodes, said electro-optical device comprising:

a first interlayer dielectric film that covers said gate lines;

a second interlayer dielectric film formed by LPD so as to cover said data lines;

a black matrix formed over said TFTs via said second interlayer dielectric film;

a third interlayer dielectric film formed by LPD so as to cover said black matrix; and

pixel electrodes formed on said third interlayer dielectric film, whereby retaining capacitors are created between said black matrix and said pixel electrodes via said third interlayer dielectric film.

5,815,227

BACKLIGHT FOR LIQUID CRYSTAL DISPLAY

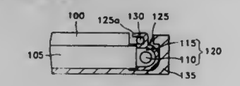
Seok-won Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

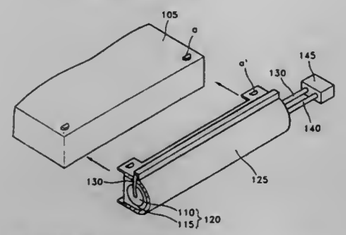
Filed Aug. 16, 1996, Ser. No. 699,513

Claims priority, application Rep. of Korea, Dec. 27, 1995, 95-59512

Int. Cl.[6] G02F *1/1335;* **F21V** *7/04*

U.S. Cl. 349—67 **10 Claims**





1. A backlight for LCD, comprising:

a light-inducing plate installed on the bottom surface of said LCD;

a lamp installed on one side portion of said light-inducing plate, to irradiate light to said LCD; and

a lamp cover enclosing a part of an outer circumferential surface of said lamp, for reflecting light from said lamp to said light-inducing plate;

wherein said light-inducing plate and said lamp cover are directly coupled with each other by a locking structure, said locking structure being comprised of:

a locking protrusion formed on at least one of upper and bottom surfaces of said light-inducing plate; and

a locking hole formed on a corresponding portion of said lamp cover.

5,815,228

LIGHTING FOR LIQUID CRYSTAL DISPLAYS

James Marvin Flynn, Raleigh, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Dec. 6, 1996, Ser. No. 761,176

Int. Cl.[6] G02F *1/1335;* **G09G** *5/00;3/36;* **F21V** *9/16*

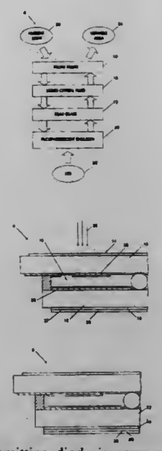
U.S. Cl. 349—71 **9 Claims**

1. An LCD device comprising:

a front light transmissive panel and a rear light transmissive panel disposed parallel to the front light transmissive panel, the front and rear light transmissive panels defining therebetween an interior space;

a layer of phosphorescent material disposed adjacent to the rear light transmissive panel and outside the interior space defined by the front and rear light transmissive panels; and

a light source for illuminating the LCD display, said light source located adjacent to said phosphorescent layer and comprising a light emitting diode;



wherein said light emitting diode is powered by a voltage pulse train.

5,815,229

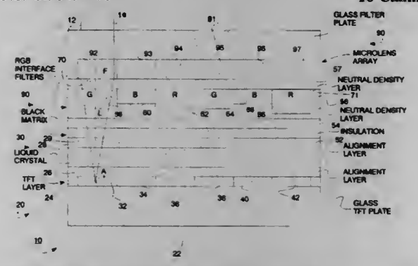
MICROLENS IMBEDDED LIQUID CRYSTAL PROJECTION PANEL INCLUDING THERMAL INSULATION LAYER

Leonid Shapiro, Lakeside, Calif., assignor to Proxima Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 345,601, Nov. 28, 1994, Pat. No. 5,606,436, which is a continuation-in-part of Ser. No. 342,920, Nov. 21, 1994, abandoned. This application Aug. 22, 1996, Ser. No. 701,495

Int. Cl.[6] G02F *1/1335;1/1343*

U.S. Cl. 349—95 **16 Claims**



16. A liquid crystal display projector, comprising:

a liquid crystal projection panel construction including a liquid crystal assembly means including a liquid crystal material for modulating light to generate an image to be projected, light exiting substrate assembly means including a plurality of pixel elements for controlling said liquid crystal material, incident light substrate assembly means spaced apart from said light exiting substrate assembly means for enclosing said liquid crystal assembly means therebetween, wherein said liquid crystal assembly means and said incident light substrate assembly means abut at a surface of engagement, said incident light substrate assembly means including an optical assembly means disposed at about said surface for focusing light through said pixel elements to enable substantially all of the light to be used for generating said image, whereby the occurrence of optical cross talk is substantially reduced;

said optical assembly means being thin as compared to the thickness of said incident light glass substrate and being disposed between said liquid crystal assembly means and said microlens means at about said surface of engagement with paid liquid crystal assembly means for determining the focal distance by spacing said microlens means from said liquid crystal assembly means;

said optical assembly means includes a plurality of individual interface filters corresponding to said lenslets and pixel elements and aligned in registration therewith for passing selectively incident light therethrough to facilitate the generation of a full color image, at least one neutral density layer disposed between said lenslets and said surface for adjusting said focal distance, and an insulation layer disposed between the neutral density layer and the lenslets to reduce the amount of heat produced by the interaction of the light with said filters; and

a light source for producing the light to illuminate said liquid crystal projection panel construction; and

a projection lens means for projecting the image.

5,815,230

LIQUID CRYSTAL DEVICE AND PROCESS FOR PRODUCTION THEREOF

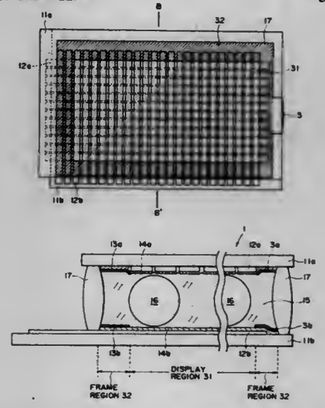
Seishi Miura, Atsugi; Hideaki Takao, Machida; Masanobu Asaoka, Yokohama; Bunryo Sato, Hachiohji; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa; Makoto Kojima, Hino; Masamichi Saito, Inagi; Sunao Mori, Yokohama, and Kazuhiro Aoyama, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1995, Ser. No. 379,755

Claims priority, application Japan, Jan. 27, 1994, 6-007617; Jan. 28, 1994, 6-008172; Jan. 28, 1994, 6-008173; Jan. 31, 1994, 6-009065; Jan. 31, 1994, 6-009066

Int. Cl.[6] G02F *1/1337;1/1335*

U.S. Cl. 349—129 **32 Claims**



20. A liquid crystal device comprising a pair of oppositely disposed substrates having opposing inner surfaces and opposing electrodes thereon, and a chiral smectic liquid crystal assuming two stable states disposed between the opposing electrodes, said liquid crystal device having an effective optical modulation region and a peripheral region outside the effective optical modulation region; wherein

at least one of the substrates in the peripheral region is coated with an alignment film comprising a perfluoro-polymer so as to provide a larger pretilt of liquid crystal molecules in the peripheral region than in the effective optical modulation region.

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5,815,231

LIQUID CRYSTAL DISPLAY AND METHOD OF MANUFACTURING THE SAME

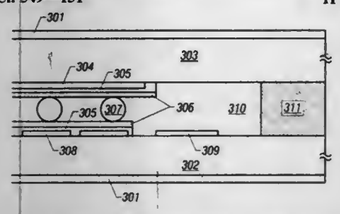
Takeshi Nishi; Toshimitsu Konuma; Takahiro Tsuji, all of Kanagawa; Yoshitaka Yamamoto, Nara; Masahiro Adachi, Nara, and Kiyoshi Ogishima, Nara, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Filed Dec. 16, 1996, Ser. No. 767,316

Claims priority, application Japan, Dec. 19, 1995, 7-349227

Int. Cl.[6] G02F *1/1345;1/1339*

U.S. Cl. 349—151 **11 Claims**



1. An active matrix liquid crystal display comprising:

a first substrate;

an active matrix circuit and a driver circuit for driving the active matrix circuit, both comprising thin film transistors formed over said first substrate;

a second substrate opposed to said first substrate with a gap therebetween, said second substrate covering both of said active matrix circuit and said driver circuit;

spacers distributed both over said active matrix circuit and said driver circuit to maintain said gap between said first and second substrates,

wherein a density of said spacers over said active matrix circuit is different from a density of said spacers over said driver circuit.

5,815,232

COLOR LIQUID CRYSTAL DISPLAY APPARATUS

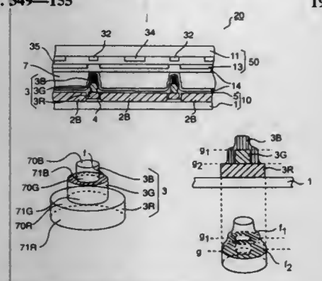
Daisuke Miyazaki; Shoichi Kurauchi; Hitoshi Hatoh; Takeshi Yamamoto, and Teruyuki Midorikawa, all of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Aug. 15, 1996, Ser. No. 698,406

Claims priority, application Japan, Aug. 18, 1995, 7-210320; Sep. 6, 1995, 7-228967

Int. Cl.[6] G02F *1/1339;1/1335*

U.S. Cl. 349—155 **19 Claims**



8. A color filter substrate comprising;

a substrate structure;

a plurality of color layers disposed on said substrate structure; and

a plurality of spacers, each of said spacers including a first spacer layer and a second spacer layer, said first and second spacer layers being stacked and one of said first and second spacer layers disposed on said substrate structure,

wherein said color layers are positioned at a predetermined distance from said spacers, each of said first and second spacer layers has a first surface on a substrate structure side and a second surface opposite to said first surface, said second spacer layer has a sectional plane which is substantially parallel to said substrate structure; and said sectional plane has a entire projective area of said-first spacer layer therein and an elongated portion from said projective area.

5,815,233

OPTICAL DEVICE CONTAINING A LIQUID CRYSTAL ELEMENT FOR CHANGING OPTICAL CHARACTERISTICS OF A LENS ELEMENT

Shigeru Morokawa, Higashi-yamato, and Yasuhiro Takaki, Yokohama, both of Japan, assignors to Citizen Watch Co., Ltd., Japan

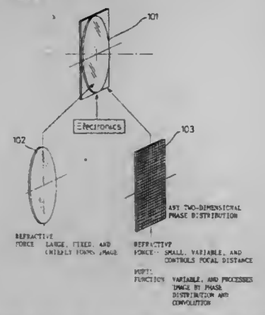
PCT No. PCT/JP94/00542, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO94/23329, PCT Pub. Date Oct. 13, 1994

Continuation of Ser. No. 343,507, Nov. 29, 1994, abandoned. This PCT application Mar. 31, 1994, Ser. No. 949,815

Claims priority, application Japan, Mar. 31, 1993, 5-108692

Int. Cl.[6] G02F *1/13;1/1335*

U.S. Cl. 349—200 **15 Claims**



1. An optical device for electrically controlling optical characteristics, comprising:

an electrically controlled phase modulation liquid crystal element having a plurality of fine image pixels with a variable refractive force, said fine image pixels being positioned relative to one another in two dimensions for modulating a phase of transmitted light waves;

a plurality of drive electrodes, including timing and data electrodes, coupled to the phase modulation liquid crystal element for driving each of said fine image pixels by time division, and

a lens with a fixed focus and having either a positive or negative refractive force larger than the refractive force of the fine image pixels optically coupled to the phase modulation liquid crystal element to define an optical system.

5,815,234

APPARATUS AND METHOD FOR VIEWING A SURFACE THROUGH A MIRROR

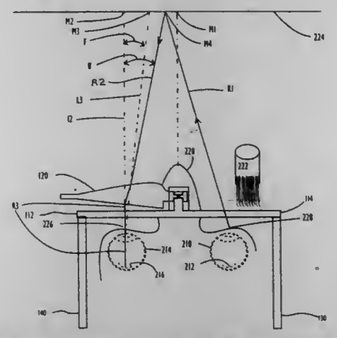
Frank Dileo, P.O. Box 1668, Bridgehampton, N.Y. 11932

Filed Mar. 7, 1997, Ser. No. 813,216

Int. Cl.[6] G02C *9/02*

U.S. Cl. 351—59 **26 Claims**

1. A frame assembly configured to allow a person to view the face through a mirror to apply a substance to the face, the mirror defining a normal angle that is normal to the mirror, the face



having a nose delineating a first face half with a first eye, and a second face half with a second eye, the frame assembly comprising:

a support;

a securer for securing the support to the head of the person; and

an optical element for receiving a light signal reflected from both the second face half and the mirror, and acting on the light signal with a prism diopter of at least 4, to bend the light signal and project the light signal onto the fovea of the first eye, wherein the optical element is coupled to the support allowing movement of the optical element from a first position in optical registration with the first eye and a second position out of optical registration with the first eye.

5,815,235

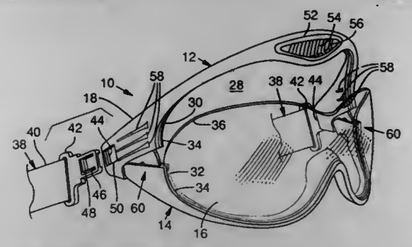
SKI GOGGLES WITH PIVOTAL FRAME MEMBERS FOR INTERCHANGING LENSES

John L. Runckel, Lake Oswego, Oreg., assignor to John L. Runckel Trust, Portland, Oreg.

Filed Jul. 9, 1997, Ser. No. 890,223

Int. Cl.[6] G02C *1/08;1/00*

U.S. Cl. 351—92 **21 Claims**



1. Ski goggles, comprising:

a unitary upper frame member configured to extend substantially between a user's temples, the upper frame member including a pair of end regions;

a unitary lower frame member configured to extend substantially between the user's temples, the lower frame member including a pair of end regions, wherein the upper and the lower frame members collectively define an aperture into which a lens is removably received; and

a pair of connectors, each connector coupling a respective one of the end regions on the upper frame member to a corresponding one of the end regions on the lower frame member, wherein the connectors maintain the connection between the end regions of the frame members while enabling the members to move between a closed position in which the lens is seated between the frame members, and an open position in which the members are moved at least partially apart from each other so that one of the frame members disengages the lens, thereby enabling the lens to be selectively removed and replaced.

5,815,236

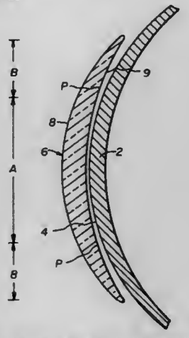
CONTACT LENS AND METHOD FOR MAKING THE SAME

Michael M. Vayntraub, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jun. 27, 1997, Ser. No. 884,079

Int. Cl.[6] G02C *7/04*

U.S. Cl. 351—160 R **9 Claims**



1. A contact lens having a back side comprising a central zone and a peripheral zone located about the central zone, wherein said lens is characterized by the peripheral zone including at least one surface defined as a logarithmic function.

5,815,237

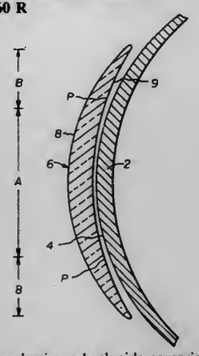
CONTACT LENS AND METHOD FOR MAKING THE SAME

Michael M. Vayntraub, North Andover, Mass., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 14, 1997, Ser. No. 856,472

Int. Cl.[6] G02C *7/04*

U.S. Cl. 351—160 R **8 Claims**



1. A contact lens having a back side comprising a central zone and a peripheral zone located about the central zone, wherein said lens is characterized by the peripheral zone including at least one surface defined by an exponential function represented by the formula:

$$y=Aexp^{(-Bx)}+C$$

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wherein: x is the linear distance from the center of the lens, y is the saggital depth of the lens at a given x value, and A, B and C are coefficients.

5,815,238

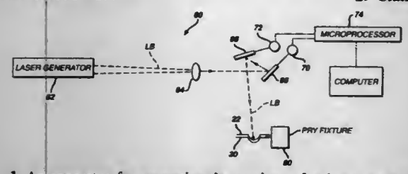
SCANNING LASER DEMOLDING OF OPHTHALMIC LENSES

Stephen R. Beaton, Neptune Beach; Denwood F. Ross, Green Cove Springs, and Craig W. Walker, Jacksonville, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Sep. 10, 1996, Ser. No. 709,832

Int. Cl.[6] G02C *7/02;* **B29D** *11/00;* **B28B** *1/00*

U.S. Cl. 351—177 **29 Claims**



1. An apparatus for separating the portions of at least one mold comprised of at least two mold portions including a first mold portion and a second mold portion, containing therein an ophthalmic lens, said apparatus comprising:

means for positioning the mold portions containing the ophthalmic lens therebetween by holding either or both mold portions at a workstation;

a source of intense electromagnetic radiation which the material of at least one of the mold portions absorbs sufficiently to cause an increase in the temperature of said material;

means for directing said radiation from said source to impinge the outer surface of either one or both of said mold portions, said radiation directing means comprising scanner means for tracing predetermined patterns over each surface to vary the amount of radiation energy for different surface areas of each surface; and

means for controlling the duration of said intense radiation impingement upon the mold portions responsive to said tracing patterns to cause, during said duration of radiation impingement, a controlled rise in the temperature of surface areas of the mold portions so impinged by the radiation from said source.

5,815,239

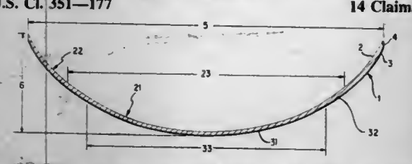
CONTACT LENSES PROVIDING IMPROVED VISUAL ACUITY

Judith E. Chapman, 1024 Royal Dr., Victor, N.Y. 14564; Ian G. Cox, 462 Eastbrooke La., Rochester, N.Y. 14618; Graham W. Biddle, 7156 County Line Rd., Ontario, N.Y. 14519; Timothy L. Comstock, 193 Chestnut Hill Dr., Rochester, N.Y. 14617, and Kevin J. DeRyke, 1406 Viking Cir., Webster, N.Y. 14580

Filed Dec. 5, 1996, Ser. No. 760,789

Int. Cl.[6] G02C *7/04*

U.S. Cl. 351—177 **14 Claims**



1. A method of improving visual acuity of a contact lens, said lens comprising a posterior surface and an anterior surface and including a central optical zone, said method comprising providing the anterior surface with a conic section having a shape factor value within the range of about 0.3 to 2.0, said shape factor value being selected so as to adjust spherical aberration in the central optical zone to a value within the range of about −0.2 diopter to about −0.6 diopter and to a value that provides improved visual acuity.

5,815,240

OPHTHALMOLOGIC DEVICE HAVING MEANS FOR CLASSIFYING THE PICTURE DATA IN THE FRAME MEMORY INTO THE BRIGHT POINT REGIONS AND THE MASK REGIONS

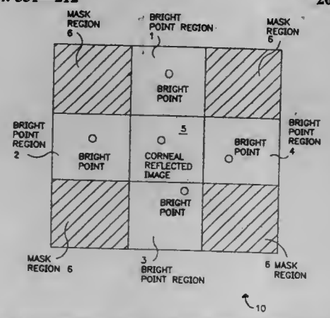
Yoichi Iki, Tokyo-to, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 10, 1997, Ser. No. 838,778

Claims priority, application Japan, Apr. 11, 1996, 8-089324

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—212 **20 Claims**



1. An ophthalmologic device to determine corneal curvature of an eye by creating a plurality of bright points on the eye from a corresponding plurality of light rays, said ophthalmologic device comprising:

an imaging unit to produce picture data corresponding to the bright points of the eye;

a frame memory to store the picture data produced by said imaging unit;

a memory controller to classify said frame memory into bright point regions in which bright points exist one at a time and mask regions in which bright points do not exist; and

a control unit to calculate corneal curvature of the eye from the image data stored in the bright point regions of said frame memory.

5,815,241

BINOCULAR INDIRECT OPHTHALMOSCOPE INCLUDING A TILTED MIRROR

Helmut Heine, Herrsching; Anton Schneider, Geisenbrunn, and Otto H. Schmidt, Herrsching, all of Germany, assignors to Heine Optotechnik GmbH & Co KG., Herrsching, Germany

Filed Jan. 29, 1997, Ser. No. 790,480

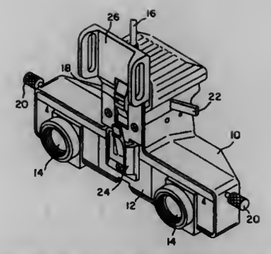
Claims priority, application Germany, Aug. 5, 1996, 296 13 549.6

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—220 **4 Claims**

1. A binocular indirect ophthalmoscope, having a housing and illumination optics, the illumination optics including a means for directing an illumination beam along a first beam path and a tilted mirror (**40**) which forms an angle with the first beam path for intersecting the illumination beam and reflecting it along a second beam path for exiting said ophthalmoscope;

wherein the tilted mirror is linearly displaced by a first control (**18**) in a direction of linear displacement which is substantially perpendicular to the second beam path of the illumination beam, is independently pivoted by a second control (**28**) about an axis which is substantially perpendicular to the second beam path of the illumination beam exiting the ophthalmoscope and substantially perpendicular to the direction of linear displacement, and directs light of the illumination beam onto a retina of a patient;



a coupling mechanism for coupling the first and the second controls (**18, 28**) to each other in such a manner that the second control (**28**) can remain at a fixed position relative to the housing (**10**) of the ophthalmoscope while the first control linearly displaces the tilted mirror;

wherein said coupling mechanism includes a guide part (**46**) attached to the housing (**10**) with a guide groove (**48**) running in the direction of linear displacement of the titled mirror (**40**) for receiving and guiding a movable element (**60**) fastened to the tilted mirror (**40**), said guide part being pivoted by the second control (**22**) and said guide groove allowing linear movement of said moveable element relative to the guide part.

5,815,242

WIDE FIELD SCANNING LASER OPTHALMOSCOPE

Douglas Cromble Anderson, Dollar; Roger Albert Lucas, Kirkcaldy, and Robert Henderson, Edinburgh, all of Great Britain, assignors to OPTOS Public Limited Company, Fife, United Kingdom

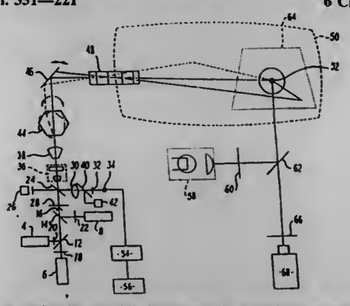
PCT No. PCT/GB94/02465, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/13012, PCT Pub. Date May 18, 1995

PCT Filed Nov. 9, 1994, Ser. No. 640,913

Claims priority, application United Kingdom, Nov. 9, 1993, 9323065

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—221 **6 Claims**



1. A scanning laser ophthalmoscope for scanning the retina of the eye comprising:

a laser light source;

a first scanning system;

a second scanning system; and

an aspherical mirror;

characterized in that:

said laser light source and said first and said second scanning systems are adapted to combine to provide a two-dimensional laser light scan from an apparent point source;

said aspherical mirror has two foci;

said aspherical mirror is adapted to transfer said two-dimensional laser light scan from said apparent point source into an eye; and

said ophthalmoscope is adapted to provide said apparent point source at a first focus of the aspherical mirror and to accommodate an eye at a second focus of the mirror.

5,815,243

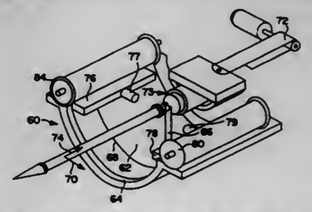
ELECTRONIC PREPRESS APPARATUS FOR PRODUCING LITHOGRAPHIC PRINTING PLATES

Dwayne E. Bailey, Billerica, and Kenneth L. Langlais, Andover, both of Mass., assignors to Agfa Division, Bayer Corporation, Wilmington, Mass.

Continuation of Ser. No. 261,763, Jun. 20, 1994, abandoned, which is a division of Ser. No. 16,055, Feb. 10, 1993, Pat. No. 5,345,870. This application Oct. 2, 1995, Ser. No. 538,058

Int. Cl.[6] G03B *27/32;27/52;* **B41N** *1/00;3/00*

U.S. Cl. 355—27 **9 Claims**



1. An electronic prepress system for producing lithographic printing plates, comprising:

a. means for storing, electronically assembling and editing digital images to be printed;

b. raster image processor means for processing said digital images thereby producing a rasterized RIP image; and,

c. means for exposing a reverse video image of said rasterized RIP image directly onto a lithographic printing plate, including support means for supporting said lithographic printing plate, scanning means for scanning a focused laser beam onto said lithographic printing plate, controlling means for controlling said scanning mechanism to expose said rasterized RIP image onto an image area of said lithographic printing plate and wherein said scanning mechanism is further controlled by the controlling means to expose a background area of said lithographic printing plate, said background area including the entire area of said lithographic printing plate which is not included in said rasterized RIP image.

5,815,244

APPARATUS FOR RECORDING INFORMATION ON PRINTING OF PHOTOGRAPHS

Kanji Tokuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 530,437, Sep. 19, 1995, abandoned, which is a continuation of Ser. No. 298,332, Aug. 30, 1994, abandoned. This application Aug. 1, 1997, Ser. No. 904,459

Claims priority, application Japan, Aug. 31, 1993, 5-215819

Int. Cl.[6] C03B *27/52*

U.S. Cl. 355—41 **34 Claims**

1. A photographic printer for producing a first photoprint from an image frame on photo film, comprising:

a first calculating section for determining fundamental exposure amounts for three primary colors by effecting photometry of said image frame;

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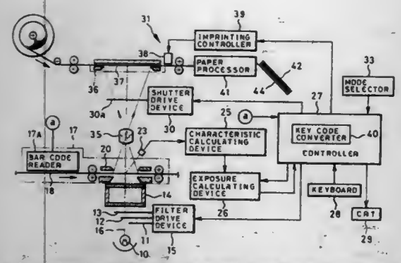


a first inputting device for inputting color correcting data for said three primary colors and density correcting data respectively to correct said fundamental exposure amounts;

a second calculating section for determining printing exposure amounts for said three primary colors in accordance with said three-color fundamental exposure amounts, said three-color color correcting data, and said density correcting data, wherein said three-color printing exposure amounts are used for exposure control in producing said photoprint;

a table memory for converting exposure correcting information into a key code, wherein said exposure correcting information is a combination of said three-color color correcting data and said density correcting data, said key code representing information to be inputted manually in producing a second photoprint from said image frame; and

an imprinting device for imprinting said key code on a recording medium.

5,815,245

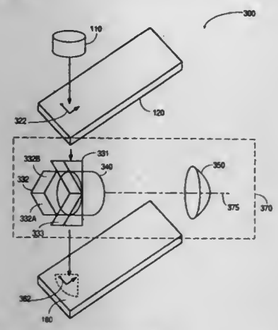
SCANNING LITHOGRAPHY SYSTEM WITH OPPOSING MOTION

Timothy N. Thomas, and Paul C. Allen, both of Beaverton, Oreg., assignors to Etec Systems, Inc., Nev.

Filed Mar. 22, 1995, Ser. No. 410,601

Int. Cl.[6] G03B *27/42;27/68;27/70*

U.S. Cl. 355—53 **23 Claims**



1. A lithography system comprising:

an optical system positioned to form on a blank, a reverted image of an illuminated portion of a reticle, wherein the reverted image is reversed along a first axis and is not reversed along a second axis which is perpendicular to the first axis; and

means for moving the blank and the reticle relative to the optical system to scan along multiple stripes that collectively illuminate a Pattern on the reticle, wherein the means for moving comprises:

means for simultaneously moving the reticle and the blank in opposite directions along the first axis; and

means for simultaneously moving the reticle and the blank in the same direction along the second axis.

5,815,246

TWO-DIMENSIONALLY BALANCED POSITIONING DEVICE, AND LITHOGRAPHIC DEVICE PROVIDED WITH SUCH A POSITIONING DEVICE

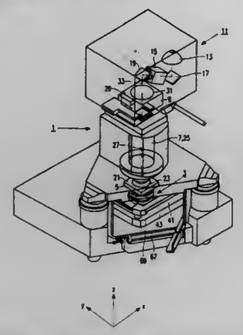
Frank B. Sperling, and Henricus W. A. Janssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 18, 1997, Ser. No. 878,362

Claims priority, application European Pat. Off., Dec. 24, 1996, 962037099

Int. Cl.[6] G03B *27/42;27/53*

U.S. Cl. 355—53 **13 Claims**



1. A positioning device provided with a base and a displaceable unit which is displaceable relative to the base by means of an X-actuator along a first guide which extends parallel to an X-direction, which X-actuator comprises a first part and a second part which are displaceable relative to one another and which exert a driving force on one another during operation, the first part of the X-actuator being coupled to the displaceable unit, seen parallel to the X-direction, and the second part of the X-actuator being coupled to a balancing unit, seen parallel to the X-direction, which balancing unit is displaceable relative to the base along a second guide which is fastened to the base and which extends parallel to the X-direction, characterized in that the displaceable unit is displaceable relative to the base along the first guide parallel to a Y-direction by means of a Y-actuator, the first guide comprising a first surface which extends parallel to the X-direction and the Y-direction, which Y-actuator comprises a first part and a second part which are displaceable relative to one another and which exert a driving force on one another during operation, while the first part of the Y-actuator is coupled to the displaceable unit, seen parallel to the Y-direction, and the second part of the Y-actuator is coupled to said balancing unit, seen parallel to the Y-direction, the second guide comprising a second surface which extends parallel to the X-direction and to the Y-direction.

5,815,247

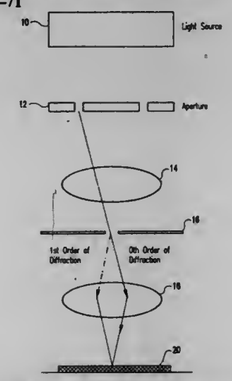
AVOIDANCE OF PATTERN SHORTENING BY USING OFF AXIS ILLUMINATION WITH DIPOLE AND POLARIZING APERTURES

Bernhard Poschenrieder, Poughkeepsie; Takashi Sato, Fishkill, and Tsukasa Azuma, Poughkeepsie, all of N.Y., assignors to Siemens Aktiengesellschaft, Munich, Germany, and Kabushiki Kaisha Toshiba, Kanagawa-Ken, Japan

Filed Sep. 21, 1995, Ser. No. 531,767

Int. Cl.[6] G03B *27/42;27/54;27/72*

U.S. Cl. 355—71 **9 Claims**



1. An off axis illumination system for photolithographic exposure of a photosensitive film on a device substrate in the manufacture of semiconductor devices comprising:

a source of light for exposing the photosensitive film;

a photomask which contains a magnified image of pattern etched into a metallic layer, said photomask being interposed between the source of light and the photosensitive film to be exposed;

a lens system between the photomask and the resist for reducing the size of an illuminated image for patterning into the photosensitive film on the device substrate; and

an aperture plate positioned between the source of light and the photomask, said aperture plate allowing the off axis exposure of the photosensitive film to be separated into two or more exposures, each of said two or more exposures being separately time optimized to avoid pattern shortening in a projected image of the photomask on the photosensitive film.

5,815,248

ILLUMINATION OPTICAL APPARATUS AND METHOD HAVING A WAVEFRONT SPLITTER AND AN OPTICAL INTEGRATOR

Kenji Nishi, Yokohama, and Naomasa Shiraishi, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 636,272, Apr. 29, 1996, abandoned, which is a continuation of Ser. No. 231,159, Apr. 22, 1994, abandoned. This application Aug. 29, 1997, Ser. No. 921,311

Claims priority, application Japan, Apr. 22, 1993, 5-095930; Jun. 11, 1993, 5-140579; Jun. 16, 1993, 5-144634

Int. Cl.[6] G03B *27/32*

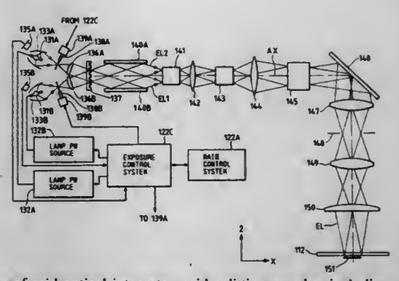
U.S. Cl. 355—71 **33 Claims**

3. An illumination optical apparatus comprising:

at least one light source;

an optical integrator located at an exit plane side of said light source;

a splitting member, disposed between said light source and said optical integrator, which splits a beam from said light source into a plurality of beams incident on said optical integrator along mutually different directions in accordance with a shape



of said optical integrator, said splitting member including an inner mirror which includes a mirror surface on its inner surface; and

a condenser optical systems, located at an exit plane side of said optical integrator, which condenses light emergent from said optical integrator to illuminate a predetermined plane.

5,815,249

ILLUMINATION OPTICAL APPARATUS AND METHOD HAVING A WAVEFRONT SPLITTER AND AN OPTICAL INTEGRATOR

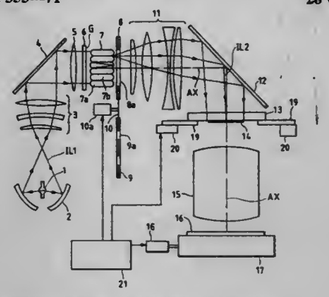
Kenji Nishi, Yokohama, and Naomasa Shiraishi, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 638,284, Apr. 26, 1996, abandoned, which is a division of Ser. No. 231,159, Apr. 22, 1994, abandoned. This application Sep. 30, 1997, Ser. No. 940,288

Claims priority, application Japan, Apr. 22, 1993, 5-095930; Jun. 11, 1993, 5-140579; Jun. 16, 1993, 5-144634

Int. Cl.[6] G03B *27/72*

U.S. Cl. 355—71 **28 Claims**



1. An illumination optical apparatus comprising:

a light source image forming member which forms a plurality of light source images from light that is incident thereon from a light source;

a condenser optical system, disposed on an exit side of said light source image forming member, which condenses beams from said plurality of light source images to illuminate an area in a predetermined plane in a superimposed manner; and

a wavefront splitting member disposed on an entrance side of said light source image forming member, and which splits a wavefront of the light from said light source into a plurality of wavefronts so as to increase the number of the light source images formed by said light source image forming member.

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5,815,250

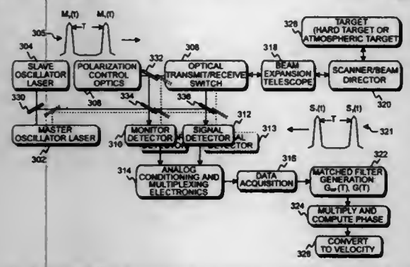
DOUBLET PULSE COHERENT LASER RADAR FOR PRECISION RANGE AND VELOCITY MEASUREMENTS

J. Alex Thomson, Santa Fe, N. Mex.; Stephen M. Hannon, Arvada, and Sammy W. Henderson, Boulder, both of Colo., assignors to Coherent Technologies, Inc., Boulder, Colo.

Filed May 27, 1997, Ser. No. 863,839

Int. Cl.[6] G01C *3/08*

U.S. Cl. 356—5.01 **32 Claims**



1. A system for determining a range and velocity of a distant object, the system comprising:

a laser for creating a doublet pulse waveform of coherent light, wherein the doublet pulse waveform comprises two pulses;

at least one optical element connected to the laser for directing the double pulse waveform toward the distant object and for receiving a reflected doublet pulse waveform returned from the distant object;

a detector circuit connected to the optical element for detecting the reflected doublet pulse waveform;

a time delay measuring circuit connected to the detector circuit for measuring a time delay between the doublet pulse waveform and the reflected doublet pulse waveform wherein the time delay defines the range of the distant object;

a phase measuring circuit for measuring a phase difference between first and second pulses in the reflected doublet pulse waveform, and for determining the velocity of the distant object from the phase difference.

5,815,251

DEVICE FOR DISTANCE MEASUREMENT

Hartmut Ehbets, Platz; Heinz Bernhard, Grub; Kurt Giger, Ruethi, and Juerg Hinderling, Heerbrugg, all of Switzerland, assignors to Leica Geosystems AG, Heerbrugg, Switzerland

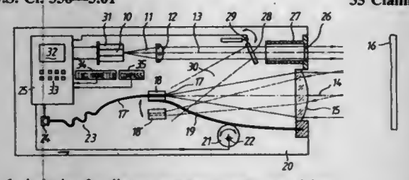
PCT No. PCT/EP94/01412, § 371 Date Nov. 5, 1995, § 102(e) Date Nov. 15, 1995, PCT Pub. No. WO94/27164, PCT Pub. Date Nov. 24, 1994

PCT Filed May 4, 1994, Ser. No. 537,852

Claims priority, application Germany, May 15, 1993, 43 16 348.3

Int. Cl.[6] G01C *3/08*

U.S. Cl. 356—5.01 **35 Claims**



1. A device for distance measurement, comprising:

a visible measuring beam (**11**) generated by a semiconductor laser (**10**),

a collimator objective lens (**12**) for collimating the measuring beam (**11**) along an optical axis (**13**) of the collimator objective lens (**12**),

a circuit arrangement for modulating the measuring beam,

a receiving objective lens (**15**) for receiving and imaging the measuring beam (**11**) reflected at a distant object (**16**) onto a receiving device,

a switchable beam deflection device (**28**) for generating an internal reference path between the semiconductor laser (**10**) and the receiving device, and

an electronic evaluation device (**25**) for determining and displaying a distance to the object (**16**),

wherein the receiving device includes a light guide (**17'**) with an optoelectronic converter (**24**) connected downstream thereof, an entry surface (**17**) of the light guide (**17'**) being arranged in an image plane of the receiving objective lens (**15**) for large distances to the object and being controllably displaceable from this position transversely to an optical axis (**14**) of the receiving objective lens (**15**).

5,815,252

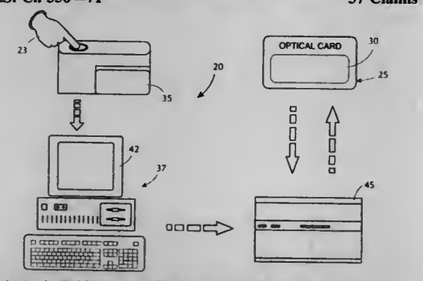
BIOMETRIC IDENTIFICATION PROCESS AND SYSTEM UTILIZING MULTIPLE PARAMETERS SCANS FOR REDUCTION OF FALSE NEGATIVES

Stephen Price-Francis, Huntington, N.Y., assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 523,328, Sep. 5, 1995, abandoned. This application Nov. 21, 1995, Ser. No. 561,323

Int. Cl.[6] G06K *9/74;* **G07D** *7/00*

U.S. Cl. 356—71 **37 Claims**



1. An individual recognition system comprising:

a storage medium storing as biometric data a plurality of physical characteristics of a user;

reading means for extracting from the user biometric data representing one of the physical characteristics stored by said storage medium;

comparison means for determining whether or not the extracted biometric data represents the same physical characteristic as corresponding stored biometric data obtained from said storage medium; and

control means for instructing said reading means to extract from the user additional biometric data representing a different physical characteristic stored by said storage medium, depending on the determination by said comparison means.

5,815,253

METHOD AND APPARATUS FOR ESTIMATING PERFORMANCE OF GAS TUBE

Jin-Sung Kim; Taek-Jin Lim, both of Suwon, and Gui-Jin Kim, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

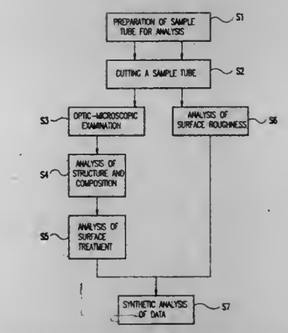
Filed Dec. 5, 1996, Ser. No. 760,511

Claims priority, application Rep. of Korea, Dec. 6, 1995, 1995 47221

Int. Cl.[6] G01N *21/88*

U.S. Cl. 356—72 **6 Claims**

1. A method for estimating the performance of a gas tube, the method comprising the steps of:



(a) preparing a gas tube to be analyzed and cutting said gas tube in a desired size and shape to obtain a sample tube;

(b) examining distribution of defects and surface condition of said cut sample tube with an optical microscope;

(c) analyzing structural and compositional features of surface defects of said cut sample tube which can not be measured in said step (b), to determine type and composition of said surface defects and shape of a surface grain;

(d) analyzing structure of an inner surface-treated layer of the sample tube along the thickness thereof; and

(e) synthetically analyzing data for defect density and surface roughness, which are numerically expressed through said steps (a) to (d), to define a reference data which can be used in practicing a semiconductor manufacturing process.

5,815,254

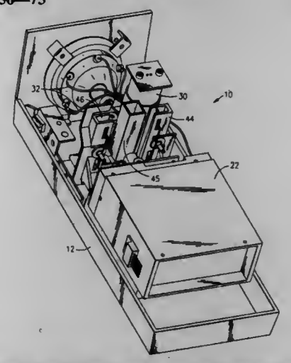
TRANSMITTANCE AND REFLECTANCE MEASURING SPECTROPHOTOMETER HAVING DUAL USE LIGHT CHANNELS

Gary R. Greene, Penfield, N.Y., assignor to Spectronic Instruments, Inc., Rochester, N.Y.

Filed Oct. 8, 1996, Ser. No. 728,296

Int. Cl.[6] G01N *21/17*

U.S. Cl. 356—73 **12 Claims**



1. A method of selectively measuring color values of a transmittance sample in a transmittance mode and a reflectance sample in a reflectance mode, comprising the steps of:

providing a first light channel from a light source to a first detector, the first light channel having a transmittance cell;

providing a second light channel from said light source to a second detector, the second light channel having a reflectance measurement area;

placing a transmittance sample in said transmittance cell and a non-light altering element in said reflectance measurement area;

comparing light passing through said first and second light channels and striking said first and second detectors to determine the color value of the transmittance sample;

removing said non-light altering element from said reflectance measurement area;

inserting a reflectance sample in said reflectance measurement area;

removing said transmittance sample from said transmittance cell;

comparing light passing through said first and second light channels and striking said first and second detectors to determine color value of the sample.

5,815,255

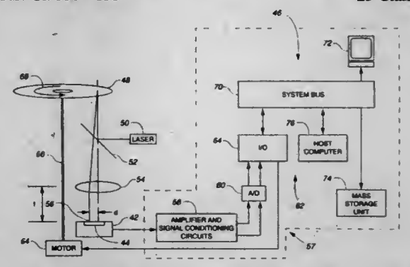
METHOD AND SYSTEM FOR MEASURING DEFLECTION ANGLE OF A BEAM OF LIGHT REFLECTED FROM A DISK TO DETERMINE TILT OF THE DISK

Mitchell G. Van Ochten, Livonia; Matthew P. Frazer, Plymouth, and Yongxing Wang, Novi, all of Mich., assignors to Medar, Inc., Farmington Hills, Mich.

Filed Feb. 14, 1997, Ser. No. 801,903

Int. Cl.[6] G01B *11/26*

U.S. Cl. 356—138 **25 Claims**



1. A method for measuring deflection angle of a beam of controlled light reflected from a disk to determine tilt of the disk, the method comprising the steps of:

generating reference data related to known radial and tangential tilt components of a reference disk;

directing the beam of controlled light at a surface of the disk having unknown radial and tangential tilt components to generate a corresponding reflected light signal having an angular displacement based on the unknown radial and tangential tilt components;

receiving the reflected light signal with an optical component for creating a relatively small focused spot of light from the reflected light signal in a detector plane wherein the optical component transforms the angular displacement of the reflected light signal into a linear displacement of the focused spot of light in the detector plane;

measuring position of radiant energy in the focused spot of light in the detector plane and producing a pair of electrical signals proportional to the linear displacement; and

processing the pair of electrical signal with the reference data to obtain a pair of values related to the deflection angle whereby the unknown radial and tangential tilt components of the disk are determined.

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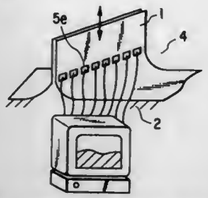
5,815,256

APPARATUS AND METHOD FOR MEASURING IN-PLANE DISTRIBUTION OF SURFACE FREE ENERGY

Yoko Fukunaga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 7, 1997, Ser. No. 797,607
Claims priority, application Japan, Feb. 9, 1996, 8-023796
Int. Cl.[6] G01B *11/26*
U.S. Cl. 356—150 **18 Claims**



1. An apparatus for measuring in-plane distribution of surface free energy, comprising:

a trough containing a liquid for immersing a target substrate having a target surface, said liquid forming a liquid level;

supporting means for supporting said target substrate so as to immerse said target substrate into said liquid in said trough such that said target surface intersects with said liquid level;

measuring means for optically detecting a parameter, at plural locations in a horizontal direction, representing a state of meniscus to be formed at an intersection area of said target surface with a surface of said liquid, thereby obtaining one dimensional information consisting of measured values of said parameter at plural locations in a first direction of said target surface;

moving means for relatively moving said liquid level and said target substrate in a vertical direction;

said measuring means optically detecting said parameter in said first direction at plural locations in a second direction perpendicular to said first direction upon said moving means relatively moving said liquid level and said target substrate in said vertical direction, and accumulating said one dimensional information obtained at said different locations in said second direction to obtain two dimensional information consisting of measured values of said parameter all over said target surface; and

distribution-forming means for forming an in-plane distribution on said target surface of said measured values of said parameter constituting said two dimensional information, or of conversion values calculated from said measured values of said parameter constituting said two dimensional information.

5,815,257

PORTABLE OPTICAL WHEEL ALIGNMENT APPARATUS AND METHOD FOR RACE CARS

Paul M. Haas, 1952 Zapo St., Del Mar, Calif. 92014

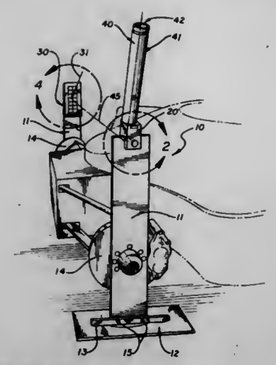
Filed Dec. 30, 1996, Ser. No. 775,389
Int. Cl.[6] G01B *11/26*
U.S. Cl. 356—155 **27 Claims**

1. An optical wheel alignment apparatus for race car vehicles comprising:

at least two rocker plates with rocker stops;

a telescope assembly;

a telescope assembly mounting base mounting said telescope assembly and adapted to be mounted to a first of said rocker plates;



at least one target plate assembly with toe and camber alignment chart adapted to be mounted to a second of said rocker plates; and

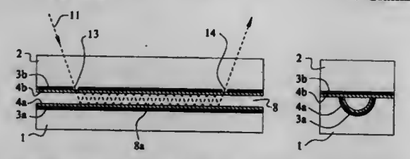
a telescope calibration plate adapted to be mounted to said first rocker plate, for mounting of said telescope assembly and telescope assembly mounting base during calibration of said telescope assembly.

5,815,258

LIQUID SAMPLE CELL FOR AN OPTICAL MEASUREMENT APPARATUS

Hiroaki Nakanishi, Nara, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Feb. 14, 1997, Ser. No. 800,386
Claims priority, application Japan, Feb. 15, 1996, 8-027795
Int. Cl.[6] G01N *21/05*
U.S. Cl. 356—246 **17 Claims**



1. A liquid sample cell used in an optical measurement apparatus in which a liquid sample flows through a flow path of the sample cell while a measurement light travels through the liquid sample in the flow path, the liquid sample cell comprising:

a first glass plate and a second glass plate fixed to each other;

the flow path being defined by a groove formed in at least one of the first glass plate and the second glass plate and an internal surface of the first glass plate or the second glass plate facing said groove;

reflection layers formed on an internal surface of the groove and on said internal surface of the first glass plate or the second glass plate; and

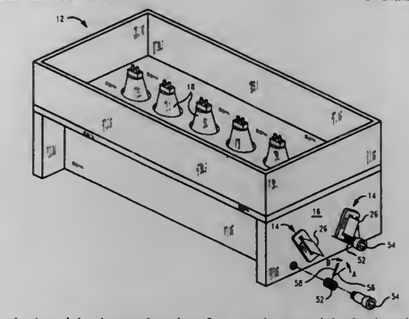
an entrance window and an exit window formed in the reflection layers to let the measurement light into the flow path and to let the measurement light out from the flow path after the measurement light is reflected by the reflection layers a plurality of times in the flow path.

5,815,259

QUICK CHANGE HOUSING

Mark Austin Brandon, Poughkeepsie; David Lee Gilbert, Newburgh, and John Robert Lankard, Jr., Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1996, Ser. No. 707,575
Int. Cl.[6] G01N *21/01;* **G01J** *4/00*
U.S. Cl. 356—244 **5 Claims**



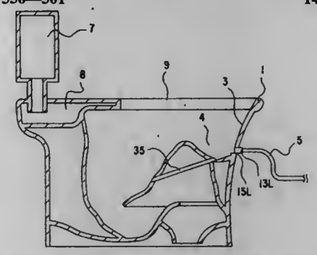
1. A quick change housing for a strip material, the housing comprising first and second panels having a proximate end, the first and second panels being configured to define there between a cavity capable of receiving a strip material therein, the proximate end having an opening in communication with the cavity and being capable of having a strip material pass therethrough, and means for reversibly securing a strip material between the first and second panels and within the holder operably associated therewith, wherein the securing means is adjacent the proximate end.

5,815,260

UROGENOUS COMPONENT MEASURING APPARATUS FOR QUALITATIVELY/QUANTITATIVELY MEASURING A PLURALITY OF UROGENOUS COMPONENTS

Xiaoming Dou; Harumi Uenoyama; Yung Xiang Wang, and Koji Matsuoka, all of Kyoto, Japan, assignors to Kyoto Dai-ichi Kagaku Co., Ltd., Minami-ku, Japan

Filed Oct. 17, 1996, Ser. No. 733,637
Claims priority, application Japan, Oct. 18, 1995, 7-296227
Int. Cl.[6] G01N *21/65*
U.S. Cl. 356—301 **14 Claims**



1. A urogenous component measuring apparatus comprising:

a stool body;

a urine collector being provided in said stool body on a position for receiving urine;

an excitation light source part for generating excitation light of a visible or infrared wavelength region;

a measuring/photoreceiving part for irradiating a urine specimen in said urine collector with said excitation light from said excitation light source part and receiving target light including Raman light generated from said urine specimen being irradiated with said excitation light;

an optical system including a spectro-detector for incorporating said target light being received in said measuring/photoreceiving part and measuring either a Raman spectral intensity at a selected measuring shift wavenumber or a Raman spectral intensity at each shift wavenumber in an arbitrary shift wavenumber range as to a urogenous component to be measured;

a data processing part for incorporating said Raman spectral intensity measured value obtained in said optical system for calculating at least one urogenous component concentrations on the basis thereof; and

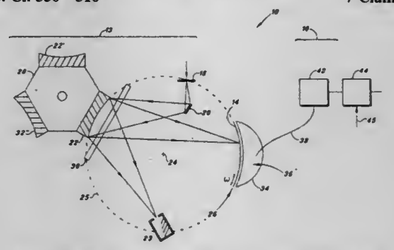
a data output part for outputting a data analysis result by said data processing part.

5,815,261

CORRELATION SPECTROMETER WITH HIGH-RESOLUTION, BROAD-BAND OPTICAL CHARACTERISTICS

Neil H. Brooks, San Diego, Calif.; Sergey N. Tugarinov, Troitsk; Nicolae N. Naumenko, Minsk, both of Russian Federation, and Torkil H. Jensen, Del Mar, Calif., assignors to General Atomics, San Diego, Calif.

Filed Apr. 16, 1997, Ser. No. 838,298
Int. Cl.[6] G01J *3/04;3/20*
U.S. Cl. 356—310 **7 Claims**



1. Apparatus for providing an electrical signal representing a measurement of the spectral similarity between an optical signal's spectra and a reference spectra, comprising:

an optical instrument that spectrally disperses the optical signal, in a dispersion direction that lies substantially in a dispersion plane, such that the signal's spectral components are projected and imaged onto an image region oriented perpendicular to the dispersion plane with the optical signal's spectral components resolved along the dispersion direction;

a mask that is located in the image region and that has a plurality of transmissive slits, wherein the slits are located along the dispersion direction at locations that encode the reference spectra;

a driver that induces relative movement in the dispersion direction of the image region between the mask and the optical signal's imaged spectral components, wherein the driver comprises a torsion column, an electro-mechanical vibrator, and a platform mounted on the torsion column, wherein the mask is mounted on the platform and the electro-mechanical vibrator is attached to the platform for oscillating the mask with respect to the imaged spectral components; and

an electro-optical sensor, responsive to light from the optical signal's spectral components passing through the transmissive slits, that provides an electrical signal that represents the intensity of light passing through the transmissive slits.

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5,815,262

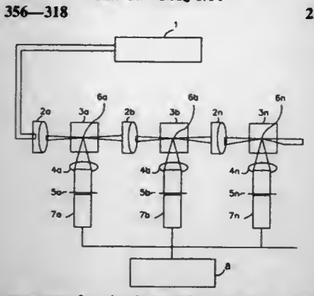
APPARATUS FOR PARALLELIZED TWO-PHOTON FLUORESCENCE CORRELATION SPECTROSCOPY (TPA-FCS), AND THE USE THEREOF FOR SCREENING ACTIVE COMPOUNDS

Wolfgang Schrof, Neuleiningen; Jürgen Klingler, Mutterstadt; Dieter Horn, Heidelberg, and Elmar Mayer, Augsburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 21, 1996, Ser. No. 700,856

Int. Cl.[6] G01J *3/30*

U.S. Cl. 356—318 **22 Claims**



1. An apparatus for simultaneously screening a plurality of samples of active compounds by carrying out laser-induced two-photon fluorescence correlation spectroscopy (TPA-FCS), comprising a plurality of volumes (*6a*, *6b* . . . *6n*) which are delimited or defined by consecutively focusing a single laser beam into the volumes, thereby creating a chain of volumes in series, and thereby allowing introduction, excitement, and observation of one sample of the plurality of samples in each of the volumes.

5,815,263

DOUBLE BEAM SPECTROPHOTOMETER

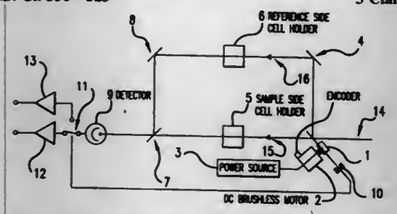
Masumi Sakai, Kyoto, Japan, assignor to Shimadzu Corporaton, Kyoto, Japan

Filed May 30, 1997, Ser. No. 865,868

Claims priority, application Japan, Jun. 11, 1996, 8-148867

Int. Cl.[6] G01J *3/42*

U.S. Cl. 356—323 **3 Claims**



1. A double-beam spectrophotometer comprising:

a sector mirror provided at at least one of a luminous flux separating portion for dividing a luminous flux from a light source, and a luminous flux combining portion for combining luminous fluxes separated before,

a DC brushless motor connected to the sector mirror for rotating the same, a number of rotation of said DC brushless motor being determined by the following formula (1):

$$\text{a number of rotation } (/s) \geqq 2 \times f \div n \qquad (1)$$

wherein 2 is constant according to Sampling theorem, f is highest frequency of measured signal (Hz), and n is a number of blades of the sector mirror, and

an encoder attached to said DC brushless motor to stop the motor at a desired position to achieve one of a double-beam measurement and a single-beam measurement.

5,815,264

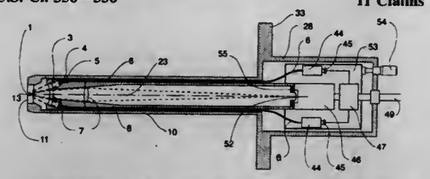
SYSTEM FOR ACQUIRING AN IMAGE OF A MULTI-PHASE FLUID BY MEASURING BACKSCATTERED LIGHT

Barry W. Reed, Auburn; Jon V. Hokanson, Redmond; Oliver S. Hamann, Redmond, and Thomas W. Montague, Redmond, all of Wash., assignors to Laser Sensor Technology, Inc, Redmond, Wash.

Continuation-in-part of Ser. No. 310,630, Sep. 21, 1994, Pat. No. 5,619,043. This application Apr. 7, 1997, Ser. No. 835,188

Int. Cl.[6] G01N *21/49*

U.S. Cl. 356—336 **11 Claims**



1. An apparatus for providing an image of a fluid medium, the apparatus comprising:

a probe for insertion into said fluid medium, said probe including a window at the tip of said probe, and said probe adapted for placement in said fluid medium such that said window is disposed at an insertion angle to a direction of flow of said fluid medium;

a light source for generating an illuminating light;

a light transmission system for transmitting said illuminating light from said light source to said window, said light transmission system including focusing lens means for focusing said illuminating light onto a focal plane in said fluid medium;

an image detector;

a processor; and

an optical system for collecting backscattered light from said fluid medium over a collection angle to form an optical image of said fluid medium, said optical system having a focal plane substantially the same as the focal plane of said illuminating light, wherein said optical system using said light transmission system for relaying the optical image to said image detector and said processor such that said image detector and said processor are operative to generate said image.

5,815,265

DEVICE AND METHOD FOR MEASURING A PARTICLE FLOW IN A FLUID

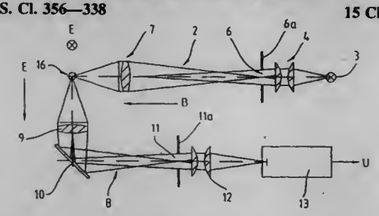
Leander Mölter, Wörth, and Friedrich Munzinger, Gondelsheim, both of Germany, assignors to Palas GmbH Partikel-und LasermeBtechnik, Kalsruhe, Germany

Filed Jul. 10, 1997, Ser. No. 890,999

Claims priority, application Germany, Jul. 12, 1996, 196 28 156.3

Int. Cl.[6] G01N *21/00;* **G02B** *26/02*

U.S. Cl. 356—338 **15 Claims**



1. Device for measuring a particle flow in a fluid with at least one illumination system having a diaphragm and with at least one receiver system having a diaphragm, characterized in that at least one diaphragm (*6a*, *11a*) has a diaphragm aperture (*6*, *11*) with and edge (*6b*, *11b*) constructed convexly towards the interior of the diaphragm aperture.

5,815,266

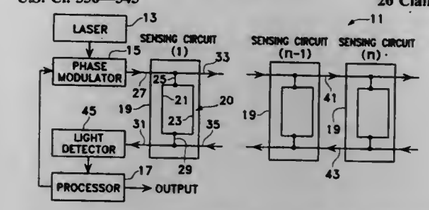
SENSING METHOD AND APPARATUS

Samuel N. Fersht, Studio City, and Donald A. Frederick, Woodland Hills, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Nov. 15, 1996, Ser. No. 749,565

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **26 Claims**



1. Sensing apparatus (A) having a configuration identified as A comprising:

a light modulator (A) having a control input port, a light input port, and a light output port, the light input port of the light modulator (A) being adapted to receive a coherent light beam;

one or more sensing circuits (A,n), the value of n denoting a particular sensing circuit, n taking on integer values from 1 to N,N being equal to or greater than 1, each sensing circuit (A,n) having an input port, an output port, zero or more input-line output ports, zero or more output-line input ports, and a two-path pair consisting of two optical transmission paths from the input port to the output port, the light output port of the light modulator (A) being optically connected to the input port of the sensing circuit (A,1), an input-line output port of sensing circuit (A,n−1) being optically connected to the input port of sensing circuit (A,n) by optical transmission medium (A,n,1) if N and n are greater than 1, the output port of sensing circuit (A,n) being optically connected to an output-line input port of sensing circuit (A, n−1) by optical transmission medium (A,n,2) if N and n are greater than 1, the combination of optical transmission medium (A,n,1) and optical transmission medium (A,n,2) representing a propagation time of T(A,n);

a light detector having one or more input ports and an output port, light entering the one or more input ports being combined, the output port of sensing circuit (A,1) being optically connected to the input port of the light detector, the light detector producing an electrical signal at its output port with an amplitude as a function of time proportional to the combined input light power as a function of time;

a processor having an input port, one or more control output ports, and a data output port, the output port of the light detector being connected to the input port of the processor, one of the one or more control output ports of the processor being connected to the control input port of the light modulator (A), the processor causing a light pulse with duration T(A) to periodically exit the light output port of the light modulator (A), T(A) being equal to or less than T(A,n) for all values of n greater than 1, the light frequency having a plurality of different values F(A,p) during the light pulse, p taking on integer values that identify the plurality of different values, the output of the light detector produced by the sensing apparatus (A) when the light frequency is F(A,p) being denoted by P(A,n,p), n denoting the particular sensing circuit, the processor determining the difference in phase for the two light paths comprising each two-path pair using the values P(A,np), the differences in phase being made available at the output port of the processor.

5,815,267

DISPLACEMENT INFORMATION MEASURING APPARATUS IN WHICH A LIGHT-RECEIVING CONDITION ON A PHOTODETECTOR IS ADJUSTABLE

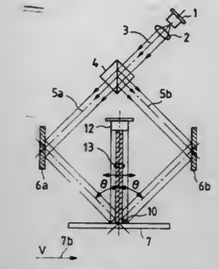
Shigeki Kato, Utsunomiya, and Makoto Takamiya, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1995, Ser. No. 525,422

Claims priority, application Japan, Sep. 9, 1994, 6-241875; Apr. 25, 1995, 7-101195

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **17 Claims**



1. An apparatus for measuring displacement information of an object to be measured, comprising:

an illumination system for illuminating an object with two light beams, having the light beams crossed;

a photodetector for receiving and detecting light from the object upon incidence of the two beams from said illumination system on the object, the displacement information of the object being measured upon obtaining information of a Doppler shift of the light detected by said photodetector; and

an adjusting member for changing a light-receiving condition on said photodetector in a portion where the light goes from the object to said photodetector.

5,815,268

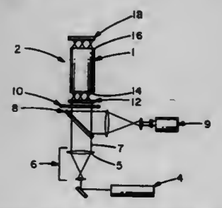
LITHOGRAPHIC LENS WAVEFRONT AND DISTORTION TESTER

L. David LaFleur, Brookfield, Conn., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 28, 1996, Ser. No. 672,291

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—359 **10 Claims**



1. A measurement device for simultaneously measuring transmitted wavefront and distortion for all field positions of a lithographic lens comprising:

a radiant energy source;

a means for collimating light emitted from said radiant energy source and directing said collimated light toward a reference surface;

a first binary optic disposed in line with said collimated light and located adjacent an input conjugate of a lens under test;

a second binary optic arranged in a spaced relationship and in line with said first binary optic for retro-reflecting light pass-

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ing through a lithographic lens disposed between said first and second binary optics; and

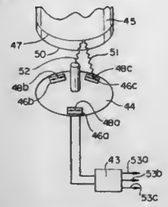
recording means for recording an interference with the light retro-reflected back through said lens and the light reflected said reference surface.

5,815,269

ROTATION SENSOR

Thomas M. Crabb, 6714 Shamrock Glen Cir., Middleton, Wis. 53562; Robert C. Richter, W9302 Red Feather Dr., Cambridge, Wis. 53523, and William L. Phillips, 5337 Century Ave., Middleton, Wis. 53562

Filed Dec. 5, 1996, Ser. No. 761,032
Int. Cl.[6] G01B *11/27*
U.S. Cl. 356—364 **15 Claims**



1. A rotation sensor comprising:

a plurality of linearly polarized light sources mounted to a first member and spaced from one another;

a second member rotatable about an axis of rotation relative to said first member;

a light reflecting surface with said second member;

a common reflected light receiving member;

a linear light polarizer rotatable with said second member between said light reflecting member and said common reflected light receiving member; and

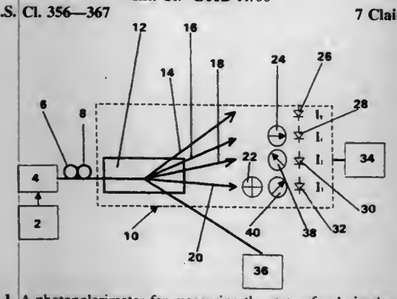
said plurality of linearly polarized light sources, said light reflecting surface and said common reflected light receiving member being positioned relative to one another such that light from said plurality of linearly polarized light sources is reflected from said light reflective surface and received by said common reflected light receiving member.

5,815,270

IN-LINE FIBER-OPTIC POLARIMETER USING A FUSED 1X5 STAR COUPLER

Shing M. Lee, Fremont, Calif., assignor to Board of Supervisors of Louisiana State University and Agricultural and Mechnical College, Baton Rouge, La.

Filed Jul. 29, 1997, Ser. No. 902,317
Int. Cl.[6] G01B *11/00*
U.S. Cl. 356—367 **7 Claims**



1. A photopolarimeter for measuring the state of polarization of a light beam, comprising:

(a) a 1×5 fiber optic coupler, capable of splitting a light source into at least five beams;

(b) a first photodetector for measuring the first beam, said first photodetector producing a first output signal corresponding to the radiation absorbed by said first photodetector;

(c) a second photodetector for measuring the second beam, coupled with a polarizer whose axis is parallel to the optical axis of the second beam, said second photodetector producing a second output signal corresponding to the radiation absorbed by said second photodetector;

(d) a third photodetector for measuring the third beam, coupled with a polarizer whose axis is 45° to the optical axis of the third beam, said third photodetector producing a third output signal corresponding to the radiation absorbed by said third photodetector; and

(e) a fourth photodetector for measuring the fourth beam, coupled with a polarizer and a quarter-wave retarder aligned with the fourth beam axis, said fourth photodetector producing a fourth output signal corresponding to the radiation absorbed by the said fourth photodetector;

the state of polarization may be determined from the four output signals and calibration coefficients characteristic of the photopolarimeter.

5,815,271

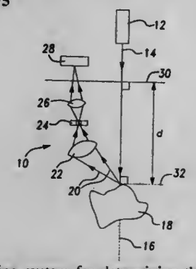
Patent Not Issued For This Number

5,815,272

FILTER FOR LASER GAGING SYSTEM

Kevin G. Harding, 2805 Windwood, #11, Ann Arbor, Mich. 48105

Filed Jan. 9, 1997, Ser. No. 780,978
Int. Cl.[6] G01B *11/14*
U.S. Cl. 356—375 **20 Claims**



1. A laser gaging system for determining the distance from a reference datum to an object surface located on a detection axis, said laser gaging system comprising:

a light source, fixed with respect to said reference datum, for projecting a highly localized light beam along said detection axis, thereby creating an illuminated area about said detection axis and illuminating said object surface located within said illuminated area,

a light sensor, fixed with respect to said light source, having means for determining when light diffusely reflected by said object surface is striking said light sensor,

a collection lens, fixed with respect to said light sensor and located between said object surface illuminated by said light beam and said light sensor,

said light source, said collection lens and said light sensor positioned so that a portion of said light beam illuminating said object surface is diffusely reflected by said object surface, passes through said collection lens, and is projected onto said light sensor, thereby allowing said distance from said reference datum to said object surface to be calculated, and

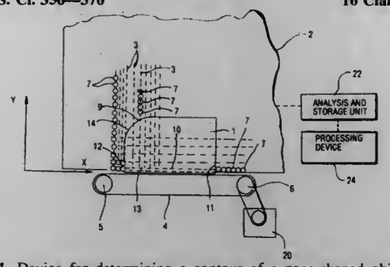
a filter, positioned between said illuminated area and said light sensor, that prevents light appearing to originate from outside said illuminated area from reaching said light sensor.

5,815,273

DEVICE TO DETERMINE THE SHAPE OF PANE-SHAPED OBJECTS

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Oct. 23, 1996, Ser. No. 736,013
Claims priority, application Austria, Oct. 23, 1995, 1753/95
Int. Cl.[6] G01B *11/24*
U.S. Cl. 356—376 **16 Claims**



1. Device for determining a contour of a pane-shaped object comprising:

a planar wall tilted relative to vertical and an adjacent generally horizontal base for supporting a side of the pane-shaped object having a planar surface parallel to said tilted wall;

at least one row of plural optical sensors (**7**),

means for moving pane-shaped object (**1**) and said optical sensors (**7**) relative to one another,

a device (**20**) to determine a distance of relative movement of the pane-shaped object,

wherein said row of optical sensors is oriented parallel to a plane of the pane-shaped object (**1**) and to said tilted wall, and not parallel to a direction of relative travel of the pane-shaped object and not parallel to said base.

5,815,274

METHOD FOR DIMENSIONAL WEIGHING BY SPACED LINE PROJECTION

Daniel F. Dlugos, Shelton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 31, 1996, Ser. No. 775,673
Int. Cl.[6] G01B *11/24; 11/02;* **H04N** *7/18*
U.S. Cl. 356—376 **14 Claims**

1. A method for measuring the dimensions of a parcel for use in a parcel processing application of a data processing device and comprising the steps of:

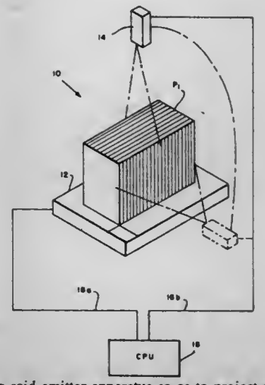
(a) placing a parcel on an essentially flat surface in a field of measurement; wherein a movably mounted emitter apparatus projects lines of a known distance apart on said placed parcel;

(b) moving said emitter apparatus so as to project a first set of lines on a first surface of said placed parcel wherein said lines may be counted by a counting means to determine a first linear dimension of said placed parcel;

(c) performing a first count on said first set of lines and transmitting said first count to a data processing device;

(d) rotating said emitter apparatus in place 90 degrees so as to project a second set of lines on said first surface of said placed parcel that are perpendicular to the lines that were projected in step 1(b), wherein said second set of lines may be counted by said counting means to determine a second linear dimension of said placed parcel;

(e) performing a second count on said second set of lines and transmitting said second count to said data processing device;



(f) moving said emitter apparatus so as to project a third set of lines on a second surface wherein said second surface is perpendicular to said first surface and, wherein said third set of lines may be counted by said counting means to determine a third linear dimension of said placed parcel;

(g) performing a third count on said third set of lines and transmitting said third count to a data processing device; and

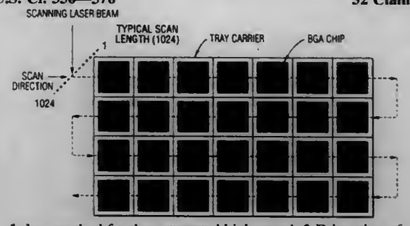
(h) applying said first count, said second count, and said third count to a look-up table in a memory of said data processing device to determine a set of linear dimensions for said placed parcel.

5,815,275

METHOD AND SYSTEM FOR TRIANGULATION-BASED, 3-D IMAGING UTILIZING AN ANGLED SCANNING BEAM OF RADIANT ENERGY

Donald J. Svetkoff, Ann Arbor; Donald K. Rohrer, Whimore Lake, both of Mich.; David A. Noblett, Aqoura, and Robert L. Jackson, Moorpark, both of Calif., assignors to General Scanning, Inc., Simi Valley, Calif.

Continuation of Ser. No. 429,543, Apr. 27, 1995, Pat. No. 5,617,209. This application Mar. 27, 1997, Ser. No. 825,108
Int. Cl.[6] G01B *11/24*
U.S. Cl. 356—376 **52 Claims**



1. In a method for the automated high-speed, 3-D imaging of an object at a vision station to develop dimensional information associated with the object, the object having a first set of inspection sites, the method including the steps of projecting a focused beam of energy having a predetermined orientation to create a plurality of points on corresponding surfaces of the first set of inspection sites and relatively translating the focused beam with respect to the first set of inspection sites in a first direction defining a first axis of motion to generate corresponding reflected signals, sensing the amount of energy in the reflected signals to generate corresponding electrical signals and processing the electrical signals to obtain a

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first set of data representing the dimensional information, including the heights of the plurality of points on the corresponding surfaces, the improvement comprising:

the predetermined orientation of the beam of energy is at a predetermined acute angle with respect to the first direction and wherein the step of translating occurs during the step of projecting.

5,815,276

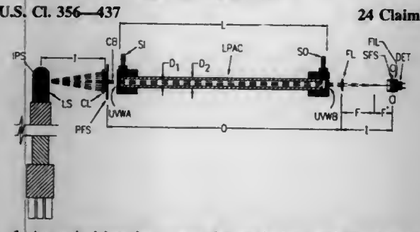
LONG-PATH ABSORBANCE-CELL IMAGING SYSTEM WITH DECREASED SYSTEM ELEMENT PARAMETER CHANGE BASED SENSITIVITY AND METHOD OF USE

Robert C. Fry, Omaha, Nebr., assignor to Transgenomic Inc., Omaha, Nebr.

Filed Oct. 6, 1997, Ser. No. 944,280

Int. Cl.[6] G01N *21/31*

U.S. Cl. 356—437 **24 Claims**



1. An optical imaging system for use in long-path absorbance-cell absorbance photometry, which optical imaging system demonstrates decreased sensitivity to internal wall reflection mediated system element parameter change in use, which optical imaging system consists of at least one optical imaging system component, each of which at least one optical imaging system component(s) sequentially comprises as elements:

a light source;

a backlighted primary limiting field stop;

an essentially tubular shaped long-path absorbance-cell;

a secondary focusing optic;

a secondary field stop; and

a light intensity detector system;

said backlighted primary limiting field stop and secondary field stop each comprising an aperture; said backlighted primary limiting field stop being placed at a distance essentially equivalent to the object distance of said secondary focusing optic away from said secondary focusing optic to one side of said secondary focusing optic, and said secondary field stop being placed in the vicinity of focal plane of said secondary focusing optic on an opposite side of said secondary focusing optic, such that said aperture in said secondary field stop is placed where a focused image of said backlighted primary limiting field stop aperture appears in use, when an essentially collimated beam of light originating from said light source is caused to pass through said aperture of said backlighted primary limiting field stop and said essentially tubular shaped long-path absorbance-cell; which focused image of said backlighted primary limiting field stop aperture demonstrates decreased sensitivity to internal wall reflection mediated system element parameter change because essentially only essentially collimated beam components which do not undergo reflection from internal walls of said essentially tubular shaped long-path absorbance-cell appear therein.

5,815,277

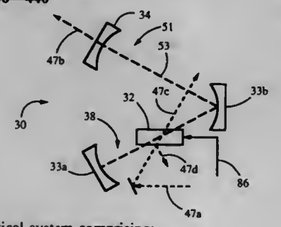
DEFLECTING LIGHT INTO RESONANT CAVITIES FOR SPECTROSCOPY

Richard N. Zare, Stanford, Calif.; Juergen Martin, Harxheim, Germany, and Barbara A. Paldus, Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior Univesity, Stanford, Calif.

Continuation-in-part of Ser. No. 879,975, Jun. 20, 1997. This application Oct. 10, 1997, Ser. No. 949,242

Int. Cl.[6] G01N *21/17*

U.S. Cl. 356—440 **24 Claims**



1. An optical system comprising:

a) a light source;

b) a resonant cavity in optical communication with said light source, said resonant cavity defining an intracavity light path, a sample being situated within said light path;

c) an input deflection means situated within said intracavity light path, for deflecting light generated by said light source onto said intracavity light path, wherein said input deflection means is capable of allowing intracavity light along said intracavity light path to pass substantially undeflected; and

d) a detection means in optical communication with said resonant cavity, for detecting light of a wavelength of interest extending from said cavity, thereby measuring an interaction of intracavity light of said wavelength with said sample.

5,815,278

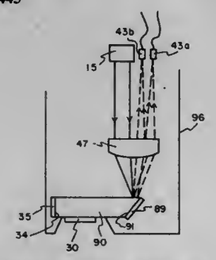
SURFACE PLASMON RESONANCE LIGHT PIPE SENSING PROBE AND RELATED INTERFACE OPTICS

Kyle Johnston, Bothell, and Sinclair S. Yee, Seattle, both of Wash., assignors to University of Washington, Seattle, Wash.

Filed Oct. 25, 1996, Ser. No. 738,442

Int. Cl.[6] G01N *21/00;* **G02B** *6/02*

U.S. Cl. 356—445 **46 Claims**



1. A surface plasmon resonance sensor which comprises:

a planar lightpipe having two longitudinal ends: an input/output end and a distal end, a sensing area on an external planar surface of said lightpipe said sensing area comprising a conducting layer that supports surface plasmon resonance, and a mirror at said distal end of the lightpipe;

a light source optically coupled to the input/output end of said lightpipe to introduce light into said lightpipe such that the light is conducted through said lightpipe by total internal reflection to reflect off the mirror at said distal end to be conducted back through said lightpipe by total internal reflection to exit the lightpipe at said input/output end in angular bands wherein during said double pass through said lightpipe, the light reflects off said sensing area exciting a surface plasmon wave therein; and

a detector for receiving angular bands of light exciting said input/output end of said lightpipe and reflected off said sensing area which thereby detects surface plasmon resonance excited by said light incident upon said sensing area.

5,815,279

METHOD AND DEVICE FOR OPTICALLY CHARACTERIZING A SURFACE

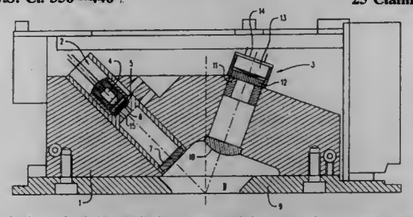
Konrad Lex, Königsdorf, Germany, assignor to Byk-Gardner GmbH, Geretsried, Germany

Filed Jul. 12, 1996, Ser. No. 679,551

Claims priority, application Germany, Jul. 13, 1995, 195 25 566.6

Int. Cl.[6] G01N *21/47*

U.S. Cl. 356—446 **25 Claims**



1. A method for optically characterizing a goniochromatic surface by measuring optical descriptors, the method comprising the steps of:

illuminating the goniochromatic surface by means of an illumination means in an illumination direction; and

measuring a fraction of light reflected from the goniochromatic surface by using a detector means so as to determine the optical descriptors for characterizing the goniochromatic surface, wherein the fraction of light is measured under only a single illumination angle between the illumination direction and the goniochromatic surface and under only a single measuring angle between the detector means and the goniochromatic surface.

5,815,280

IMAGE RECORDING APPARATUS WITH PRIORITIZATION OF INPUT

Hiroshi Ohmura, Inagi; Yoshinobu Aiba, Yokohama; Masanori Sakai, Yokohama; Hideto Kobtani, Yokohama; Keizo Isemura, Kokubunji; Koulchi Unno; Hirohiko Itoh, both of Kawasaki; Takehito Utsunomiya, Yokohama; Makoto Kikugawa, and Hideyuki Makitani, both of Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 957,092, Oct. 6, 1992, abandoned. This application Feb. 5, 1996, Ser. No. 596,539

Claims priority, application Japan, Oct. 9, 1991, 3-260918; Oct. 31, 1991, 3-285948; Nov. 11, 1991, 3-294363

Int. Cl.[6] H04N *1/21;1/32*

U.S. Cl. 358—296 **36 Claims**

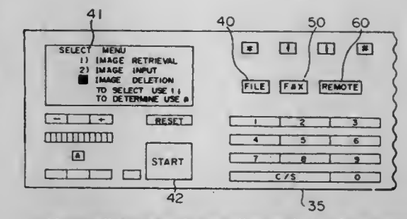
1. An image recording apparatus comprising:

a plurality of input means for inputting image information;

selection means for selecting one of said input means;

recording means for recording an image in accordance with the image information input from said input means selected by said selection means on a recording member; and

requesting means for requesting an operator to set a priority of selection by said selection means in response to one of said input means starting inputting of image information while said recording means is recording an image in accordance with the image information from another of said input means.



5,815,281

IMAGE SIGNAL OUTPUTTING APPARATUS HAVING SPECIAL EFFECTS PRODUCING CAPABILITY

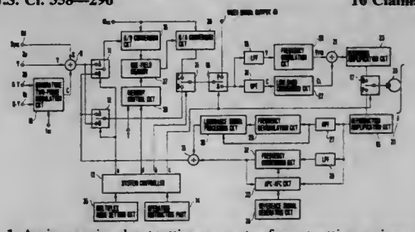
Hiroto Yasumura; Masahide Hirasawa; Minoru Noji, all of Kanagawa-ken; Susumu Kozuki, Tokyo; Koji Takahashi, Kanagawa-ken; Katsuji Yoshimura, Kanagawa-ken, and Tomohiko Sasatani, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 343,616, Nov. 22, 1994, Pat. No. 5,732,186, which is a continuation of Ser. No. 236,234, May 2, 1994, abandoned, which is a continuation of Ser. No. 962,027, Oct. 15, 1992, abandoned, which is a continuation of Ser. No. 544,036, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 63,620, Jun. 16, 1987, abandoned. This application May 1, 1996, Ser. No. 641,652

Claims priority, application Japan, Jun. 20, 1986, 61-094475; May 14, 1987, 62-117604; May 14, 1987, 62-117605

Int. Cl.[6] H04N *1/00;5/225;9/74*

U.S. Cl. 358—296 **16 Claims**



1. An image signal outputting apparatus for outputting an image signal, comprising:

(a) image sensing means for sensing an image of an object and for outputting a motion-picture image signal corresponding to the sensed image of the object;

(b) reproducing means for reproducing the motion-picture image signal from a recording medium on which motion-picture image signals outputted from said image sensing means are recorded, and for thereafter outputting the reproduced motion-picture image signal;

(c) still-picture image signal holding means for extracting a still-picture image signal corresponding to a picture either from the motion-picture image signal outputted from said image sensing means or from the motion picture image signal outputted from said reproducing means, holding temporarily the still-picture image signal thus extracted and thereafter outputting the extracted still-picture image signal;

(d) mode instruction means having a slow/still reproducing mode and a special effects producing mode for instructing either one of said modes; and

(e) control means for controlling said still-picture image signal holding means to extract a still-picture image signal corresponding to one picture from the motion-picture image signal outputted from said reproducing means and to hold temporarily said still-picture image signal thus extracted to be outputted thereafter, when said slow/still reproducing mode is

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instructed by said mode instruction means, and to extract a still-picture image signal corresponding to one picture from the motion-picture image signal outputted from said image sensing means and to hold temporarily said still-picture image signal thus extracted to be outputted thereafter, when said special effects-producing mode is instructed by said mode instruction means.

5,815,282

CASSETTE HAVING COLOR-PRINTED RECESSED AND CONVEYED SURFACES

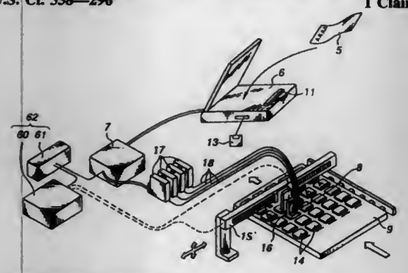
Kenichi Kano, Miyagi, Japan, assignor to Sony Corporation, Japan

Division of Ser. No. 196,184, Feb. 22, 1994. This application Feb. 28, 1997, Ser. No. 808,868

Claims priority, application Japan, Jun. 24, 1992, 4-188914; Feb. 26, 1993, 5-094823

Int. Cl.[6] H04N *1/23;1/46;* **B41J** *3/00;2/01*

U.S. Cl. 358—296 **1 Claim**



1. A cassette comprising:

a cassette main member having recessed and convexed areas on a surface on which printing is to be formed, said cassette main member having a recording medium housed therein;

a first printed layer formed continuously between upstanding wall sections of the recessed and convexed areas of the cassette main member and bottom surfaces of said recessed areas or top surfaces of said convexed areas, said first printed layer being formed by ejecting ink vertically downward from a first ink jet printing head;

a second printed layer formed by color printing based on picture information indicative of the color printing to be formed on said first layer, said second printed layer being formed by ejecting ink vertically downward from a second ink jet printing head, and

a third protective layer formed over said second printed layer, said third protective layer being formed by ejecting ink vertically downward from a third ink jet printing head.

5,815,283

IMAGE FORMING APPARATUS

Koichi Watanabe, Kawasaki, and Hironobu Machida, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 673,825, Jun. 27, 1996. This application Nov. 5, 1997, Ser. No. 968,855

Claims priority, application Japan, Jun. 30, 1995, 7-165504

Int. Cl.[6] H03M *7/30*

U.S. Cl. 358—296 **21 Claims**

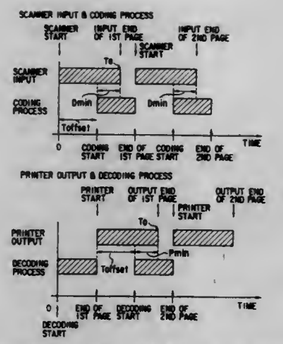
1. An image forming apparatus comprising:

means for reading image data from a manuscript;

an image memory for storing the image data read by the reading means;

means for writing the image data read by the reading means into the image memory;

code memory for storing coded image data;



means for coding the image data stored in the image memory and storing the coded data in the code memory;

means for decoding the coded data stored in the code memory and storing the decoded data into the image memory;

means for forming an image corresponding to the decoded image data stored by the decoding means in the image memory; and

control means for enabling a writing operation of the writing means and a coding operation of the coding means to progress simultaneously during controlling so that the coding operation may not pass the writing operation.

5,815,284

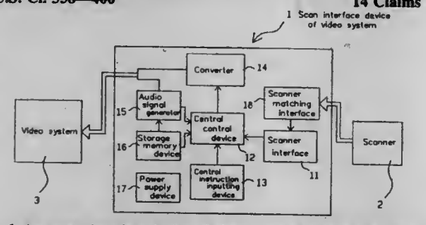
SCANNER INTERFACE DEVICE OF VIDEO SYSTEM

Andy Cheng, Hsin-Chu, Taiwan, assignor to Must Systems Inc., Hsin-Chu, Taiwan

Filed May 5, 1995, Ser. No. 435,666

Int. Cl.[6] H04N *1/00;1/32;1/40;1/04*

U.S. Cl. 358—400 **14 Claims**



1. A scanner interface device of video system adapted to be used with a scanner scanning a scanned object to obtain a scanned signal comprising:

a scanner interface receiving said scanned signal outputted by said scanner, transforming said scanned signal into a preliminary video signal, and outputting said preliminary video signal;

a converter electrically connected to said scanner interface for receiving said preliminary video signal and directly transforming said preliminary video signal into a secondary video signal complying with a specific video system format; and

a control unit electrically connected to said scanner interface and said converter for controlling said scanner interface device and executing an editing action on said preliminary video signal; wherein said video system format is one selected from a group consisting of NTSC (National Television System Committee), SEQAM (Sequence And Memory), PAL (Phase Alternation Line), and HDTV (High Definition TV).

5,815,285

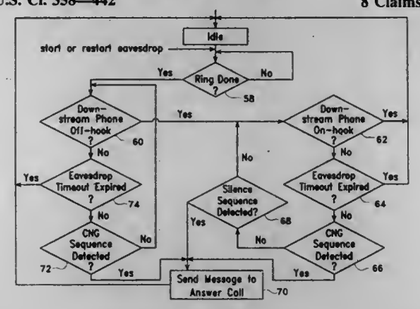
FACSIMILE DEVICE WITH USER-FRIENDLY AUTOMATIC RECEIVE MODE

Melissa L. Monty, Poway, and Paul Albitz, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 22, 1996, Ser. No. 701,413

Int. Cl.[6] H04N *1/32*

U.S. Cl. 358—442 **8 Claims**



1. In a facsimile device for receiving incoming facsimile transmissions over an incoming telephone line to which a downstream telephone answering device may optionally be connected:

mode means responsive to a first manual input, for selecting one of only two possible operational modes: a single automatic receive mode and a manual receive mode;

delay setting means for setting a predetermined number of rings following the beginning of a ring sequence representative of a new incoming call after which the facsimile device automatically goes off-hook when in the automatic receive mode;

start means responsive to a second manual input, for initiating manual reception of an incoming facsimile transmission,

a ring detection process responsive to the delay setting mean, for determining whether said predetermined number of rings has elapsed following the reception of said ring sequence representative of an incoming call;

a monitoring process for determining whether an incoming fax tone representative of an incoming facsimile transmission has been received before said predetermined number of rings had been received; and

a call answering process responsive to the manually operated start means and to the ring detection process and to the monitoring process, for answering the incoming call by maintaining the facsimile device in an off-hook condition and transmitting an outgoing fax tone representative of readiness to receive an incoming facsimile transmission, wherein

the call answering process is enabled if and only if the start means has been manually operated, or the facsimile device is in said single automatic receive mode and the predetermined number of rings have been received, or

the facsimile device is in said single automatic receive mode and the incoming fax tone is detected before the predetermined number of rings have been received; and

the facsimile device is configured for operating in said single automatic mode independently of whether a second device is connected to the same line and independently of how and where that other device is connected to said line.

5,815,286

METHOD AND APPARATUS FOR PRODUCING HALFTONE IMAGE WITH THRESHOLD MATRIX

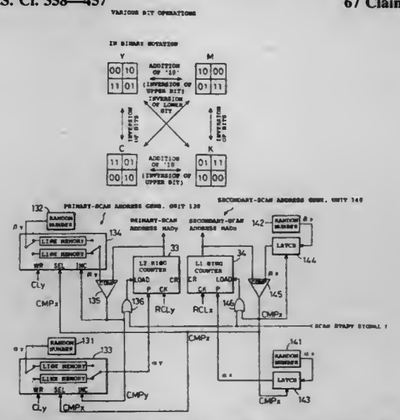
Masayoshi Matsuba; Tadashi Fukuda, and Yoshio Ono, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Feb. 1, 1995, Ser. No. 382,101

Claims priority, application Japan, Feb. 1, 1994, 6-030936; Nov. 2, 1994, 6-293809; Dec. 2, 1994, 6-329410; Dec. 2, 1994, 6-329411

Int. Cl.[6] H04N *1/40*

U.S. Cl. 358—457 **67 Claims**



1. A method of generating a halftone image by comparing multi-tone image data with threshold data read out of an acting threshold matrix, comprising the steps of:

(a) producing said acting threshold matrix by: dividing a matrix area of said acting threshold matrix into a plurality of sub-matrices of an equal size, each of said plurality of sub-matrices including a plurality of threshold data; setting a difference between said plurality of threshold data in said each sub-matrix to a predetermined value; and arranging said plurality of threshold data in said each sub-matrix so that relatively small threshold data are arranged diagonally while relatively large threshold data are also arranged diagonally wherein a maximum of said relatively small threshold data is less than or equal to a minimum of said relatively large threshold data;

(b) reading out threshold data from said acting threshold matrix;

(c) comparing said multi-tone image data with said threshold data read out of said acting threshold matrix, to thereby produce a binary image signal; and

(d) producing said halftone image responsive to said binary image signal.

5,815,287

IMAGE FORMING PROCESSOR HAVING FIRST AND SECOND IMAGE PROCESSING SECTIONS

Hirokazu Yamada, Kobe, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 6, 1995, Ser. No. 554,411

Claims priority, application Japan, Nov. 10, 1994, 6-276352 U; Nov. 10, 1994, 6-276353

Int. Cl.[6] H04N *1/40*

U.S. Cl. 358—458 **20 Claims**

1. An image processor comprising:

a first image processing section for accomplishing a first image process of image data input synchronously with first clock signals, and which outputs first processed image data synchro-

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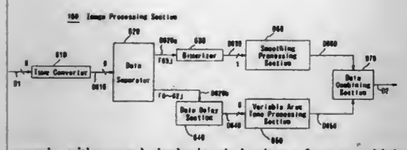


nously with second clock signals having a frequency higher than said first clock signals;

a second image processing section for accomplishing a second image process of image data input synchronously with said first clock signals, and which processes in parallel with said first image process and outputs second processed image data synchronously with said second clock signals;

a data combining section for combining image data respectively output from said first image processing section and said second image processing section; and

a data delay section provided at an upstream side of said first image processing section to delay image data for a period of time corresponding to a difference in required processing times between said first image process and said second image process.

5,815,288

FACSIMILE APPARATUS WITH CHANGEABLE TRANSMISSION ENERGY LEVEL AND TRANSMISSION SPEED

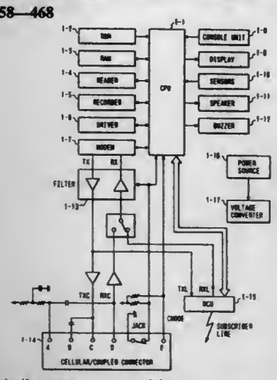
Yosuke Ezumi; Toshio Kenmochi; Hisashi Toyoda, all of Yokohama, and Takeshi Tsukamoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 91,600, Jul. 15, 1993, abandoned. This application May 1, 1997, Ser. No. 847,241

Claims priority, application Japan, Jul. 17, 1992, 4-190945

Int. Cl.[6] H04N *1/36;1/32;* **H04M** *11/00*

U.S. Cl. 358—468 **26 Claims**



1. A facsimile apparatus comprising:

communication means for communicating data through a communication line;

changing means for changing a transmission energy level of a signal transmitted by said communication means to the line,

wherein said changing means changes the transmission energy level by a manual instruction; and

a start key for instructing the start of the communication to said communication means,

said changing means changing the transmission energy level in accordance with the depression duration of the start key.

5,815,289

FACSIMILE APPARATUS

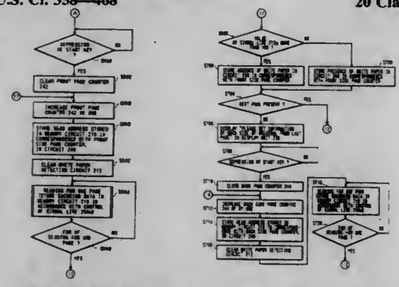
Takehiro Yoshida, Tokyo; Naoki Sugawara, Yokohama, and Tatsushi Tsugawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 194,142, Feb. 8, 1994, abandoned. This application Sep. 28, 1995, Ser. No. 535,813

Claims priority, application Japan, Feb. 9, 1993, 5-044686; Apr. 30, 1993, 5-128122

Int. Cl.[6] H04N *1/32*

U.S. Cl. 358—468 **20 Claims**



1. An original reading apparatus comprising:

reading means for reading a side of an original sheet set therein to provide a corresponding image;

control means for controlling said reading means to read, in a first order, a plurality of sheets, having first and second sides, set in a page order in said reading means, where all of the first sides are set facing a first direction and all of the second sides are set facing a second, opposite direction, said first order being all of the first sides in the page order followed by all the second sides in the page order;

storing means for storing the images provided by said reading means corresponding to each of the sides read in the first order; and

output means for outputting the images stored in said storing means in a second order, said second order being, for each sheet in the page order, the image corresponding to the first side followed by the image corresponding to the second side.

5,815,290

GUIDE APPARATUS OF CONTACT IMAGE SENSOR

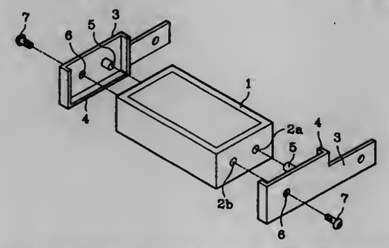
Dong-Soo Nam, Gumi-City, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 3, 1996, Ser. No. 697,946

Claims priority, application Rep. of Korea, Aug. 31, 1995, 1995 28396

Int. Cl.[6] H04N *1/04;* **H01L** *27/00;* **F16M** *11/00*

U.S. Cl. 358—498 **4 Claims**



1. A guide apparatus affixed to a contact image sensor, the guide apparatus comprising:

a guide rib in a form of a rectangle having one open side;

a fixing projection at an inner center of said rib; and

a hole disposed in said inner center of said rib so as to be separated from said fixing projection;

wherein said contact image sensor includes two holes on a side surface thereof so as to be separated apart from each other, said side surface of said contact image sensor being engaged into an inner portion of said guide rib, said fixing projection being engaged into one of said two holes of said side surface of said contact image sensor, and said hole of said guide rib being immediately adjacent to the other of said holes on said side surface of said contact image sensor, so that said guide apparatus and said contact image sensor are fixedly assembled by a fastener engaging the other of the holes on said side surface of said contact image sensor after passing through said hole in said guide apparatus.

5,815,291

IMAGE READING APPARATUS

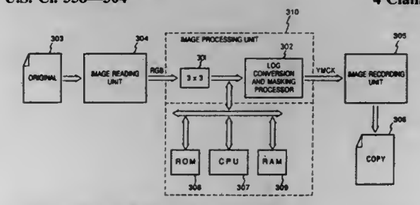
Seita Shono, Warabi, and Akihiro Usami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 998,863, Dec. 30, 1992, Pat. No. 5,485,284. This application Nov. 13, 1995, Ser. No. 556,654

Claims priority, application Japan, Jan. 6, 1992, 4-000112; Feb. 13, 1992, 4-026424

Int. Cl.[6] H04N *1/56;1/60*

U.S. Cl. 358—504 **4 Claims**



1. An image reading apparatus comprising:

reading means for generating image information representing a transparent original by illuminating the transparent original with light; and

converting means for converting the image information to color signal data,

wherein the color signal data is repressed by a combination of three stimulus data corresponding to vertices of a triangle which substantially contacts a spectrum locus of an xy chromaticity diagram at wavelengths of about 505 nm and 525 nm, and substantially overlaps the locus of a purple boundary formed by connecting 380 nm and 780 nm.

5,815,292

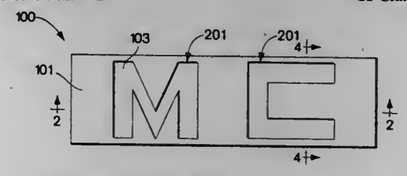
LOW COST DIFFRACTION IMAGES FOR HIGH SECURITY APPLICATION

Glenn J. Walters, Duxbury, Mass., assignor to Advanced Deposition Technologies, Inc., Taunton, Mass.

Continuation-in-part of Ser. No. 604,329, Feb. 21, 1996, abandoned. This application May 6, 1996, Ser. No. 627,341

Int. Cl.[6] G02B *5/18;* **G03H** *1/04;* **B42D** *15/10*

U.S. Cl. 359—2 **21 Claims**



1. A security device, comprising:

a first plastic film having a surface relief diffraction pattern on a first surface thereof;

a first metal layer disposed on the first plastic film;

a second plastic film laminated to a structure including the first plastic film and the first metal layer; and

a second metal layer which is reflective everywhere except where an aperture therethrough has an edge which defines an outline of an image seen as a reflection of the first metal layer, the second metal layer disposed on the second plastic film.

5,815,293

COMPOUND OBJECTIVE LENS HAVING TWO FOCAL POINTS

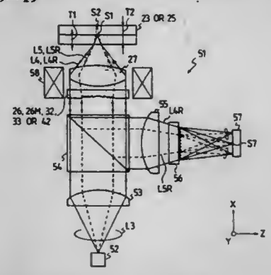
Yoshiaki Komma, Kyoto; Sadao Mizuno, and Seiji Nishino, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 190,520, Feb. 1, 1994, Pat. No. 5,446,565. This application May 31, 1995, Ser. No. 455,934

Claims priority, application Japan, Feb. 1, 1993, 5-14432; Aug. 4, 1993, 5-193353

Int. Cl.[6] G02B *5/32;3/10;3/08;7/00*

U.S. Cl. 359—19 **18 Claims**



1. A compound objective lens, comprising:

lens means, having a first convex surface and a second convex surface opposite to each other, for receiving a beam of incident light of one particular wavelength passing through an optical axis at the first convex surface, refracting the beam of incident light and emitting a beam of refracted light from the second convex surface; and

plural focal point generating means for receiving the beam of incident light not yet refracted by the lens means, generating from the beam of incident light a plurality of beams of divided light including a first beam of divided light and a second beam of divided light, converging the beams of divided light at a plurality of focal points which are placed on the optical axis on a side facing the second convex surface of the lens means on condition that the first beam of divided light transmits through a first substrate and is converged on an information recording plane placed at a first distance T1 from a surface of the first substrate at a diffraction limit and that the second beam of divided light transmits through a second substrate and is converged on an information recording plane placed at a second distance T2 (T1≠T2) from a surface of the second substrate at a diffraction limit.

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5,815,294

OPTICAL TRANSMISSION SYSTEM WITH TRANSMISSION CHARACTERISTIC MEASURING DEVICE

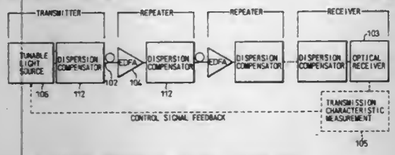
George Ishikawa; Hiroshi Nishimoto; Hiroki Ool; Motoyoshi Sekiya, and Hiroaki Tomofuji, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 510,474, Aug. 2, 1995. This application Jan. 3, 1997, Ser. No. 778,544

Claims priority, application Japan, Aug. 2, 1994, 6-181013; Mar. 17, 1995, 7-059295; Jul. 18, 1995, 7-181929

Int. Cl.[6] H04B *10/08; 10/00*

U.S. Cl. 359—110 **7 Claims**



1. An optical transmission system comprising:

an optical transmitter for generating an optical signal;

an optical transmission line for transmitting the optical signal generated by the optical transmitter;

an optical receiver for recognizing the optical signal transmitted over the optical transmission line;

an optical amplification repeater installed at an intermediate point along the optical transmission line, for optically amplifying the optical signal being transmitted along the optical transmission line;

a wavelength converter for converting the wavelength of the optical signal optically amplified in the optical amplification repeater,

said optical transmitter including a tunable light source whose emission wavelength is adjusted to achieve the adjustment of the wavelength of the optical signal; and

transmission characteristic measuring means for measuring a transmission characteristic by evaluating the quality of the optical signal recognized by the optical receiver, wherein

the wavelength converter and the tunable light source adjust the wavelength of output light so that the transmission characteristic measured by the transmission characteristic measuring means is best adjusted.

5,815,295

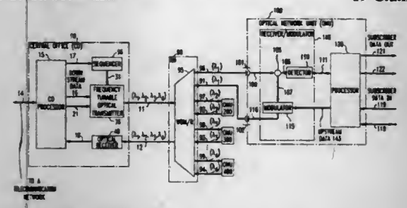
OPTICAL COMMUNICATION SYSTEM WITH IMPROVED MAINTENANCE CAPABILITIES

Thomas Edward Darcie, Middletown; Nicholas J. Frigo, Atlantic Highlands, and Peter D. Magill, Freehold, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 439,059, May 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 333,926, Nov. 3, 1994, Pat. No. 5,559,624, which is a continuation of Ser. No. 29,724, Mar. 11, 1993. This application Oct. 8, 1996, Ser. No. 728,253

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—128 **19 Claims**



1. Apparatus comprising:

a coupler arrangement responsive to an input signal S arriving at an input port, which signal includes a carrier that is modulated with data destined to the apparatus, the coupler arrangement delivering a first signal corresponding to M×S, where M is a constant, and a second signal corresponding to N×S, where N is a constant;

a detector responsive to the first signal, detecting said data;

a processing/control arrangement responsive to the detector for

receiving data detected by the detector,

applying signals developed from the data received from the detector to a data output port,

receiving signals at a data input port, and

outputting data signals to be transmitted; and

a modulator responsive to the second signal and to the data signals of the processing/control arrangement, modulating said second signal with the data signals to form a modulated upstream signal and applying the modulated upstream signal to an output port.

5,815,296

OPTICAL COMMUNICATION METHOD FOR PERFORMING COMMUNICATION USING A PLURALITY OF WAVELENGTHS, AND OPTICAL COMMUNICATION SYSTEM FOR PERFORMING COMMUNICATION USING A PLURALITY OF WAVELENGTHS

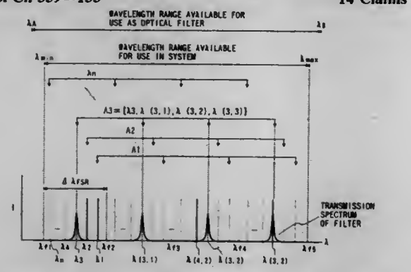
Ouichi Kubota, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1996, Ser. No. 648,488

Claims priority, application Japan, May 17, 1995, 7-118495

Int. Cl.[6] H04J *14/02;* **H04B** *10/06*

U.S. Cl. 359—133 **14 Claims**



1. An optical communication method for an optical communication system, which connects a plurality of optical nodes via an optical transmission path, and performs a communication by multiplying a plurality of channels in the optical transmission path, comprising the steps of:

performing transmission by the transmitting optical node using a wavelength belonging to a wavelength group constituting a single channel, wherein each of the plurality of channels is constituted by a wavelength group consisting of a plurality of wavelengths separated from each other by a predetermined first wavelength interval; and

performing reception by the receiving optical node by matching light detectivity peaks of optical detection means, which detects light in the optical transmission path and has a plurality of detectivity peaks separated by intervals corresponding to a natural number multiple of the predetermined first wavelength interval, with the wavelengths constituting the wavelength group o a required channel;

wherein a wavelength range for use in the communication system is equal to or larger than the natural number multiple of the predetermined first wavelength interval.

5,815,297

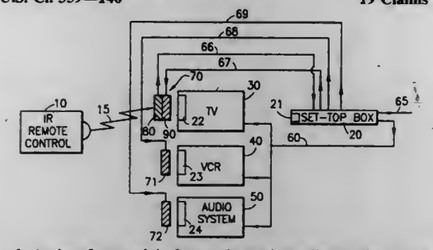
INFRARED INTERFACE AND CONTROL APPARATUS FOR CONSUMER ELECTRONICS

Walter S. Clciora, SouthPort, Conn., assignor to General Instrument Corporation of Delaware, Chicago, Ill.

Filed Oct. 25, 1995, Ser. No. 547,841

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—146 **19 Claims**



1. An interface module for an electronic appliance of the type that is controlled by radiated signals transmitted through free space, and which has a built-in signal detector for detecting the radiated signals, comprising:

a housing which comprises a material which substantially blocks radiated signals;

said housing being adapted to be affixed over the signal detector of the electronic appliance to prevent the signal detector from detecting stray radiated signals; and

a transmitter portion carried by said housing for radiating control signals to the signal detector when the housing is affixed over said signal detector.

5,815,298

SYSTEM AND METHOD FOR WIRELESSLY COMMUNICATING A SOUND SIGNAL

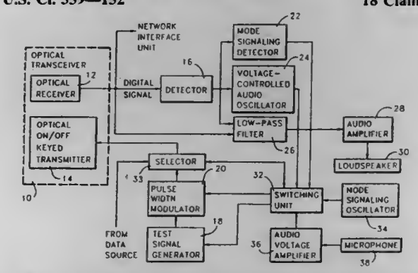
Yehuda Cern, Efrat, Israel, assignor to Jolt Ltd., Jersusalem, Israel

Filed Jul. 25, 1996, Ser. No. 684,905

Claims priority, application Israel, Jul. 25, 1995, 114727

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—152 **18 Claims**



10. A multi-mode communication system for providing data communications and audio feedback communications, said system comprising:

an optical transceiver, including an optical receiver and an optical ON/OFF keyed transmitter;

a detector coupled to said optical receiver for providing a DC voltage signal output which is substantially proportional to the amplitude of the signal received at said optical receiver;

a voltage controlled audio oscillator coupled to said detector for providing an audio output signal of a frequency proportional to the DC voltage signal provided by said detector;

a lowpass filter coupled to said detector for separating a received audio signal from a carrier signal and for eliminating said carrier signal;

an audio amplifier coupled to said lowpass filter for amplifying said received audio signal;

a loudspeaker coupled to said audio amplifier, for producing a speech signal in accordance with the amplified received audio signal;

a selector for selecting a mode of operation;

a mode signalling detector coupled to said detector, for providing a signal indicating the selected mode of operation;

a mode signalling oscillator for providing a signal associated with said signal indicating the selected mode of operation;

a microphone for generating an audio signal representative of speech;

an audio voltage amplifier coupled to said microphone, for amplifying said audio signal;

a switching unit coupled to said mode signalling detector, to said voltage controlled audio oscillator, to said mode signalling oscillator, to said selector and to said audio voltage amplifier, for switching between available modes of operation;

a test signal generator for generating a carrier test signal; and

a pulse width modulator coupled to said test signal generator, to said switching unit, and to said optical transmitter, wherein said pulse width modulator modulates the pulse width of said signal provided via said switching unit in accordance with said selected mode of operation, over said carrier test signal, to control generation of ON/OFF keyed optical signals by said optical transmitter.

5,815,299

METHOD AND SYSTEM FOR EQUALIZING RESPECTIVE POWER LEVELS OF CHANNELS OF A RECEIVED OPTICAL FREQUENCY DIVISION MULTIPLEXED SIGNAL

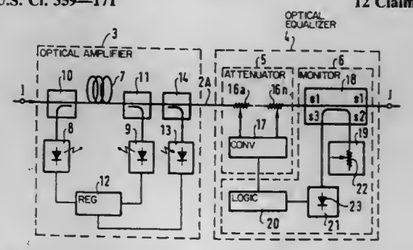
Dominique Bayart, Clamart, and Bertrand Desthieux, Paris, both of France, assignors to Alcatel N.v., Rijswijk, Netherlands

Filed Sep. 6, 1996, Ser. No. 709,152

Claims priority, application France, Sep. 8, 1995, 95 10548

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—171 **12 Claims**



1. A method of equalizing respective power levels of channels of an optical frequency division multiplexed signal, including the following operations:

determining the power level of each channel of said optical frequency division multiplexed signal;

introducing attenuation into the channels having power levels that are high relative to a reference level corresponding either to the power level of the channel having the lowest power level or to a level determined from the power levels of the channels having power levels near to that of said channel having the lowest power level, the attenuation applied to said channels having high power levels corresponding to the difference between a power level deduced from the power levels of said channels having high power levels and said reference level.

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5,815,300

OPTICAL READING APPARATUS HAVING OPTICAL SCANNER FOR SCANNING INFORMATION ON OBJECTS

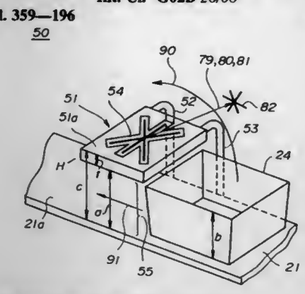
Masanori Ohkawa, Kawasaki; Toshiyuki Ichikawa, Atsugi; Toshimitsu Kumagai, Kawasaki; Yuuichiro Takashima, Machida; Hiroshi Watanuki, Sagamihara; Shinichi Sato, Kawasaki; Mitsuharu Ishii, Hachioji; Yoshitaka Murakawa, Fuchu; Kozo Yamazaki, Hadano, and Hiroyuki Ikeda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 274,348, Jul. 13, 1994, abandoned. This application Sep. 17, 1997, Ser. No. 932,172

Claims priority, application Japan, Jul. 14, 1993, 5-174431

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—196 **20 Claims**



1. An optical reading apparatus comprising:

an optical scanning unit for emitting upward a scanning light beam to be used to optically read information on an article; and

a supporting mechanism for supporting said optical scanning unit so that said optical scanning unit is maintained in a space over a surface of a counter in a state where a distance between said optical scanning unit and the surface of said counter is a predetermined length;

wherein said supporting mechanism is connected to said counter at a side opposite to a side facing an operator.

5,815,301

SCANNING OPTICAL APPARATUS

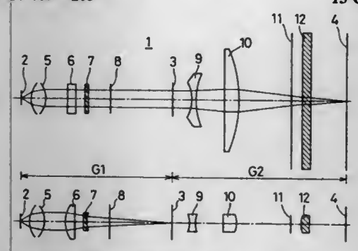
Toshio Naiki; Akiyoshi Hamada, and Yoshihiro Inagaki, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Apr. 17, 1996, Ser. No. 633,377

Claims priority, application Japan, Apr. 21, 1995, 7-096627; Apr. 21, 1995, 7-097095

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—205 **13 Claims**



1. A scanning optical apparatus, comprising:

a light source;

a deflector for deflecting a light beam emitted from the light source to a main scanning direction;

a first imaging unit, including a first resin lens having a negative refractive power only in a sub-scanning direction perpendicular to the main scanning direction, for making the light beam emitted from the light source form an image in the vicinity of the deflection position of said deflector in the sub-scanning direction; and

a second imaging unit, including a second resin lens having a positive refractive power only in the sub-scanning direction, for making the light beam deflected by the deflector form an image on a scanned surface in the sub-scanning direction wherein said first resin lens and said second resin lens compensate for variation in each other's refractive power due to temperature changes.

5,815,302

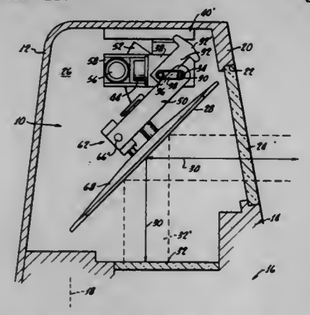
VIEWING APPARATUS WITH A COUNTERBALANCED AND ARTICULATED MIRROR

Ray E. Mc Vey, El Segundo; Yeong-Wei A. Wu, Rancho Palos Verdes, and John J. Anagnost, Torrance, all of Calif., assignors to Hughes Electronic, El Segundo, Calif.

Filed Oct. 11, 1995, Ser. No. 540,736

Int. Cl.[6] G02B *7/182;26/08*

U.S. Cl. 359—214 **30 Claims**



1. A viewing apparatus for selectively directing the line-of-sight of a viewer, said viewing apparatus comprising:

a mirror for reflecting light from a scene to provide an image of the scene for the viewer;

a support structure pivotally holding said mirror, said support structure including a support arm pivoting near a first end thereof about a support arm pivot axis on said support structure for selectively varying an elevational angle of said mirror relative to the scene, said support arm near an opposite second end thereof supporting said mirror, wherein the weight of said mirror and said support arm exert a mirror torque about said support arm pivot axis;

a counterbalance pivotally connected at a first end thereof to said support structure about a counterbalance pivot axis, wherein the weight of said counterbalance exerts a counterbalance torque about said counterbalance pivot axis, and wherein said support arm pivot axis is substantially parallel to said counterbalance pivot axis; and

a linkage coupling said counterbalance pivot axis to said support arm pivot axis with a flexible belt-like member so that said mirror torque and said counterbalance torque oppose one another upon movement of said mirror.

5,815,303

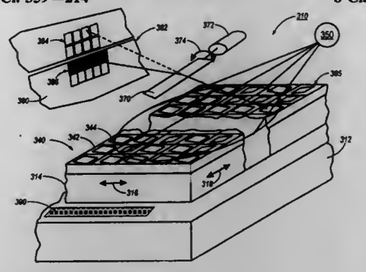
FAULT TOLERANT PROJECTIVE DISPLAY HAVING REDUNDANT LIGHT MODULATORS

Andrew A. Berlin, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1997, Ser. No. 883,418

Int. Cl.[6] G02B *26/08;26/00*

U.S. Cl. 359—214 **8 Claims**



1. A display system comprising

a light source,

a display surface,

a two dimensional light modulator array in an optical path between the light source and the display surface, the two dimensional light modulator array having a plurality of light modulators arranged in rows to modulate light from the light source, with at least one row being susceptible to failure,

a redundant light modulator array having a second plurality of light modulators arranged in rows to modulate light from the light source, and

an optical element positioned to selectively direct light incident on the redundant light modulator array toward the display surface to substitute for at least one failed row of light modulators in the two dimensional light modulator array.

5,815,304

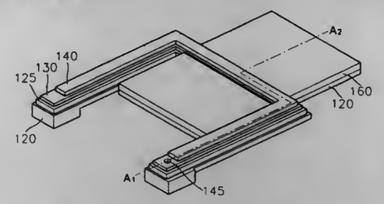
THIN FILM ACTUATED MIRROR ARRAY IN A OPTICAL PROJECTION SYSTEM AND METHOD FOR MANUFACTURING THE SAME

Yoon-Joon Choi, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 31, 1997, Ser. No. 792,453

Int. Cl.[6] G02B *26/00*

U.S. Cl. 359—291 **27 Claims**



1. A thin film actuated mirror array in an optical projection system being actuated by a first signal and a second signal, said thin film actuated mirror array in an optical projection system comprising:

a substrate having electrical wiring and a connecting terminal for receiving the first signal from outside and transmitting the first signal;

an actuator having a bottom electrode for receiving the first signal, a top electrode corresponding to said first bottom electrode for receiving the second signal and generating an electric field between said first top electrode and said first bottom electrode and deformed by the electric field, and a supporting layer having a first portion attached beneath said bottom electrode and a second portion exposed out of said bottom electrode, wherein said bottom electrode, said active layer, and said top electrode each has a U-shape and the second portion of said supporting layer has a rectangular shape; and

a reflecting means for reflecting a light, said reflecting means being formed on the second portion of said supporting layer.

5,815,305

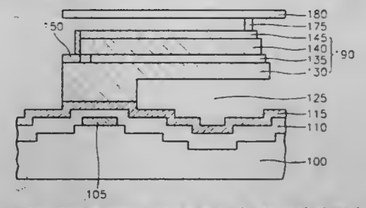
THIN FILM ACTUATED MIRROR ARRAY IN AN OPTICAL PROJECTION SYSTEM AND METHOD FOR MANUFACTURING THE SAME

Yong-Ki Min, and Yoon-Joon Choi, both of Seoul, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 10, 1997, Ser. No. 814,019

Int. Cl.[6] G02B *26/00*

U.S. Cl. 359—292 **29 Claims**



1. A thin film actuated mirror array in an optical projection system being actuated by a first signal and a second signal, said thin film actuated mirror array comprising:

a substrate having an electrical wiring and a connecting terminal for receiving the first signal from outside and transmitting the first signal;

an actuator comprising a supporting layer formed on said substrate, a bottom electrode for receiving the first signal, said bottom electrode being formed on said supporting layer, a top electrode corresponding to said bottom electrode for receiving the second signal and generating an electric field between said top electrode and said bottom electrode, and an active layer formed between said top electrode and said bottom electrode and deformed by the electric field;

a common line for applying the second signal to said top electrode, said common line being formed on a portion of said actuator and being connected to said top electrode and to an adjacent top electrode of an adjacent actuator; and

a reflecting means for reflecting a light, said reflecting means being formed on said top electrode.

5,815,306

"EGGCRATE" SUBSTRATE FOR A TWISTING BALL DISPLAY

Nicholas K. Sheridon, Los Altos; Linda T. Romano, Sunnyvale; James C. Mikkelsen, Jr., Los Altos; Edward A. Richley, Palo Alto, and Joseph M. Crowley, Morgan Hill, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1996, Ser. No. 773,664

Int. Cl.[6] G02B *26/00*

U.S. Cl. 359—296 **20 Claims**

1. Apparatus comprising:

a substrate comprising a cavity-containing matrix having a plurality of cavities, the cavities of the plurality being disposed substantially in a single layer in the matrix and being arranged within the matrix substantially in a geometrically regular pattern; and

a plurality of optically anisotropic particles disposed in the cavities in the substrate, each cavity containing at most one of

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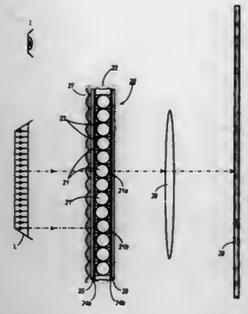


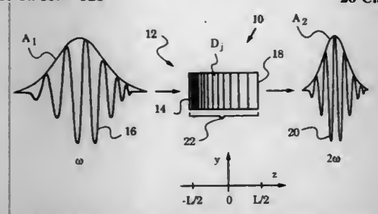
the optically anistropic particles, a rotatable disposition of each particle being achievable while said particle is thus disposed in the substrate, said particle, when in said rotatable disposition, not being attached to the substrate.

5,815,307

APERIODIC QUASI-PHASEMATCHING GRATINGS FOR CHIRP ADJUSTMENTS AND FREQUENCY CONVERSION OF ULTRA-SHORT PULSES

Mark A. Arbore, Palo Alto, and Martin M. Fejer, Menlo Park, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 26, 1997, Ser. No. 824,032
Int. Cl.[6] G02F *1/37;* **G02B** *5/18*
U.S. Cl. 359—328 **26 Claims**



1. An apparatus for chirp adjustment and frequency conversion of an ultra-short input optical pulse A_1 having a center angular frequency $\omega_{1,0}$, said apparatus comprising:
a) a non-linear optical material;
b) a quasi-phasematching grating in said non-linear optical material having an aperiodic pattern of regions D_j such that passing said ultra-short input optical pulse A_1 through said regions D_j produces a chirp-adjusted and frequency-converted output optical pulse A_2.

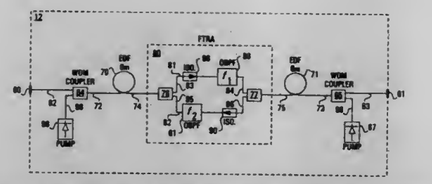
5,815,308

BIDIRECTIONAL OPTICAL AMPLIFIER

Hyung B. Kim, Kanata; Farideh Khaleghi, Ottawa; Jinghui Li, Nepean, and Mohsen Kavehrad, Cumberland, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 20, 1996, Ser. No. 650,536
Int. Cl.[6] H01J *5/16;* **H04B** *9/00;* **H01S** *3/103*
U.S. Cl. 359—341 **10 Claims**

1. A bidirectional optical amplifier device comprising a first input/output port and a second input/output port, a first optical amplifier coupled to the first input/output port, a second optical amplifier coupled to the second input/output port and a bidirectional frequency tunable reflection attenuator (FTRA) coupled between the first and second optical amplifiers, the FTRA allowing



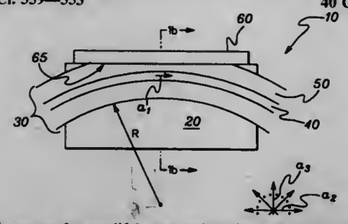
optical signals within a first predetermined frequency band to pass from the first optical amplifier to the second optical amplifier and substantially preventing optical signals within a second predetermined frequency band from passing from the first optical amplifier to the second optical amplifier and allowing optical signals within the second predetermined frequency band to pass from the second optical amplifier to the first optical amplifier and substantially preventing optical signals within the first predetermined frequency band from passing from the second optical amplifier to the first optical amplifier.

5,815,309

OPTICAL AMPLIFIER AND PROCESS FOR AMPLIFYING AN OPTICAL SIGNAL PROPAGATING IN A FIBER OPTIC

Brian L. Lawrence, Watervliet; Kevin J. McCallion, Albany, and Michael H. Shimazu, Valatie, all of N.Y., assignors to Molecular OptoElectronics Corporation, Watervliet, N.Y.

Filed Jan. 21, 1997, Ser. No. 786,047
Int. Cl.[6] H01S *03/00;* **G02B** *06/26*
U.S. Cl. 359—333 **40 Claims**



1. A process for amplifying an optical signal in an optical fiber employing a channel overlay waveguide over a side-polished portion of the optical fiber, said channel overlay waveguide exhibiting a non-linear response of second order, said process comprising:
(a) transferring optical energy from the optical signal in the optical fiber to the channel overlay waveguide;
(b) amplifying said optical energy in the channel overlay waveguide to produce amplified optical energy; and
(c) returning the amplified optical energy to the optical signal in the optical fiber, thereby amplifying said optical signal without degrading optical signal integrity.

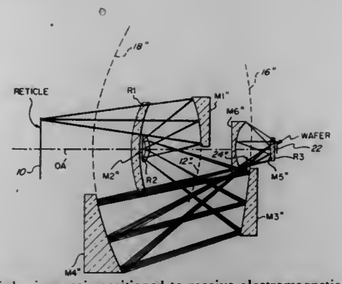
5,815,310

HIGH NUMERICAL APERTURE RING FIELD OPTICAL REDUCTION SYSTEM

David M. Williamson, West Malvern, United Kingdom, assignor to SVG Lithography Systems, Inc., Wilton, Conn.

Filed Dec. 12, 1995, Ser. No. 571,081
Int. Cl.[6] G02B *17/00;21/00;23/00;5/10*
U.S. Cl. 359—365 **18 Claims**

1. An optical reduction system for use in photolithography, from the long conjugate end to the short conjugate end, comprising:
a first mirror pair;
a field mirror pair positioned to receive electromagnetic radiation reflected from said first mirror pair;



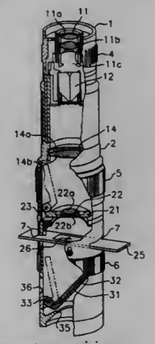
a third mirror pair positioned to receive electromagnetic radiation reflected from said field mirror pair;
a first refractive element positioned between an object and said first mirror pair;
a second refractive element positioned near a second mirror of said first mirror pair; and
a third refractive element positioned between an image and said third mirror pairs,
whereby an intermediate image is re-imaged to a final image at an image plane.

5,815,311

OPTICAL EQUIPMENT

Masuya Ishikawa, Tokyo, Japan, assignor to Hifumi Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP95/01225, § 371 Date Feb. 3, 1997, § 102(e) Date Feb. 3, 1997, PCT Pub. No. WO97/01121, PCT Pub. Date Jan. 9, 1997
PCT Filed Jun. 20, 1995, Ser. No. 776,910
Int. Cl.[6] G02B *21/00;23/00*
U.S. Cl. 359—381 **2 Claims**



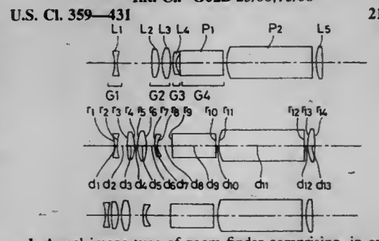
1. An optical equipment comprising:
an ocular;
a first objective lens disposed in front of said ocular;
a second objective lens which is disposed in front of said first objective lens and can be selectively shifted between an advanced position where said second objective lens intersects the optical axis of said first objective lens and a retreated position where said second objective lens does not intersect the optical axis of said first objective lens;
a first shifting ring means for selectively shifting said second objective lens between said advanced position and said retreated position;
a holder provided in front of said second objective lens to support an object to be magnified;
a mirror which is disposed in front of said holder that supports an object to be magnified, said mirror so disposed as to be selectively shifted between an advanced position where said mirror intersects the optical axis of said first objective lens and a retreated position where said mirror does not intersect the optical axis of said first objective lens; and
a second shifting ring means for selectively shifting said mirror between said advanced position and said retreated position.

5,815,312

REAL IMAGE TYPE FINDER

Hideyasu Takato, Hino, Japan, assignor to Azusa Patent Office, Tokyo, Japan

Filed Mar. 13, 1996, Ser. No. 614,719
Claims priority, application Japan, Mar. 14, 1995, 7-054446
Int. Cl.[6] G02B *23/00;13/06*
U.S. Cl. 359—431 **21 Claims**



1. A real image type of zoom finder comprising, in order from the object side, an objective having a positive refracting power, an optical system for inverting the upper, lower, left and right parts of an image formed by said objective, and an eyepiece having a positive refracting power, wherein said objective consists essentially of a first lens group having a negative refracting power, a second lens group having a positive refracting power, a third lens group having a negative refracting power and a fourth lens group having a positive refracting power, separations between said respective lens groups being varied for zooming, and conforms to the following conditional inequality (1):

$$1.35<|f_1/f_2|\times m_T<2.4 \quad (1)$$

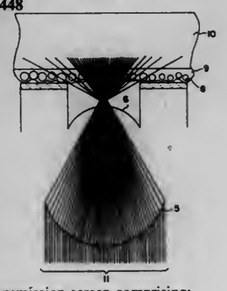
where:
f_1 is a focal length of the first lens group,
f_2 is a focal length of the second lens group, and
m_T is a magnification of the finder at the telephoto end.

5,815,313

LIGHT TRANSMISSION SCREEN AND ITS MANUFACTURING METHOD

Katsuaki Mitani, Ibaraki; Hirokazu Sakaguchi, Toyonaka, and Satoshi Aoki, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 17, 1995, Ser. No. 390,779
Claims priority, application Japan, Mar. 11, 1994, 6-041243
Int. Cl.[6] G03B *21/56*
U.S. Cl. 359—448 **25 Claims**



1. A light transmission screen comprising:
a Fresnel lens sheet;

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a lenticular lens sheet arranged on a radiant light side of said Fresnel lens sheet; and

a front diffusion panel, formed of a diffusion layer and a transparent layer, and arranged on a radiant light side of said lenticular lens sheet,

wherein said diffusion layer includes at least a granular light diffusing diffusion material, and said diffusion layer has an uneven surface corresponding to a respective depth of said diffusion material throughout said diffusion material.

5,815,314

IMAGE DISPLAY APPARATUS AND IMAGE DISPLAY METHOD

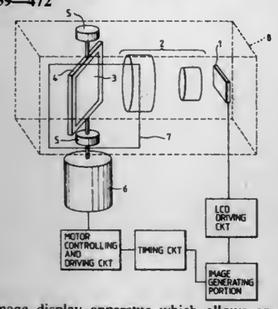
Toshiyuki Sudo, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,360, Dec. 23, 1994, abandoned. This application Oct. 15, 1997, Ser. No. 950,884

Claims priority, application Japan, Dec. 27, 1993, 5-330727

Int. Cl.[6] G02B *27/24*

U.S. Cl. 359—472 **25 Claims**



1. An image display apparatus which allows an observer to recognize a stereoscopic image comprising:

display means for displaying an image by emitting a light;

a focusing optical system for focusing the image displayed on said display means, upon an image surface wherein a width of an exit pupil of said focusing optical system in a horizontal direction is smaller than a predetermined width between both eyes of said observer; and

image surface moving means for rotating said image surface around a single axis in said image surface as a rotation axis, so that said exit pupil of said focusing optical system is rotated around said single axis with regard to the observer.

5,815,315

TRUCK MIRROR WIND SCOOP ASSEMBLY

Drew P. Garland; Brian P. Garland, both of P.O. Box 840, Suwanne, Ga. 30174, and Tony Abee, Rte. 2 Box 1285 Barrett Pkwy., Dahlonega, Ga. 30533

Filed Sep. 20, 1996, Ser. No. 717,402

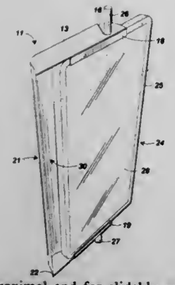
Int. Cl.[6] G02B *5/08;7/182;* **B60R** *1/06*

U.S. Cl. 359—509 **6 Claims**

1. A wind scoop assembly for directing an air stream across a reflective surface of a side view mirror assembly attached to a vehicle to remove beaded water from the reflective surface as the vehicle moves in a forward direction, the side view mirror assembly including a windward surface opposite the reflective surface, a side edge portion, an upper mounting rod, and a lower mounting rod, said assembly comprising:

an upper arm having a distal end and a proximal end and defining an upper arm slot adjacent the proximal end for slidably mounting said upper arm to the upper mounting rod;

a lower arm spaced from said upper arm, said lower arm having a distal end and a proximal end and defining a lower arm slot



adjacent the proximal end for slidably mounting said lower arm to the lower mounting rod;

an elongate contoured cowling extending between and attached to the distal ends of said upper and lower arms, said cowling having an elongate outside edge, an opposed elongate inside edge, and a curvilinear body portion therebetween, said cowling being constructed and arranged to define an intake scoop between the outside edge and a side edge portion of the mirror assembly, an exhaust slot between the inside edge and the reflective surface of the mirror assembly, and a progressively narrowing air passageway passing from the intake scoop to the exhaust slot for increasing the velocity of the air stream passing therethrough as the vehicle moves in the forward direction;

a first flange depending from said upper arm for bearing against the windward surface of the mirror assembly; and

a second flange depending from said lower arm for bearing against the windward surface of the mirror assembly;

wherein said first and second flanges stabilize said assembly on the mirror assembly and wherein said first and second flanges maintain said cowling in a fixed position with respect to the mirror assembly as the vehicle moves in a forward direction.

5,815,316

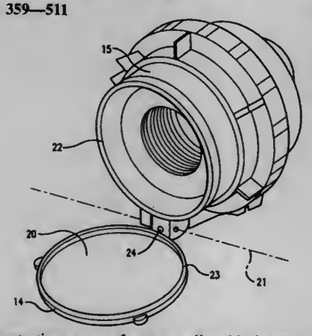
PROTECTION SYSTEM AND TECHNIQUE FOR ELECTRO-OPTICAL SYSTEMS

Melvin H. Friedman, Alexandria, and Lesley R. Condiff, Woodbridge, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1997, Ser. No. 921,367

Int. Cl.[6] G03B *11/04*

U.S. Cl. 359—511 **2 Claims**



1. A protection system for a set adjustable brightness control level regardless of previous deactivation of system display component in a thermal weapon sight (TWS) when a lens cap is utilized for covering a fore-optic of the TWS comprising:

a system display component within the TWS for producing a visual display of a thermal image scene at an adjustable brightness control level;

a power source within the TWS for producing power to the system display component;

a telescope assembly removably coupled to the TWS for at least assisting in the viewing of the thermal image scene;

a lens cap, removably coupled to said telescope assembly, for providing physical protection to the fore-optic of said telescope assembly; and

a micro-switch actuator, coupled to said telescope assembly, for providing activation of said power source, such that when said lens cap is not covering the fore-optic, said micro-switch actuator is not closed, and power is provided to the system display component at a set adjustable brightness control level, and when said lens cap is covering the fore-optic, said micro-switch actuator is closed thereby effecting no power to the system display component of the TWS, whereby when the lens cap is again not covering the fore-optic, said display component continues to produce said set adjustable brightness control level.

5,815,317

EYEPIECE WITH BROAD VISIBILITY

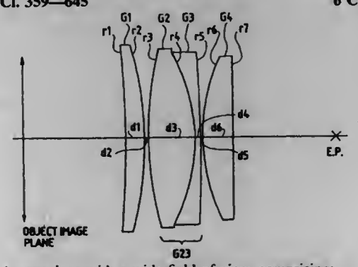
Yasuhiro Omura, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 7, 1997, Ser. No. 813,760

Claims priority, application Japan, Mar. 14, 1996, 8-085697

Int. Cl.[6] G02B *25/00*

U.S. Cl. 359—645 **6 Claims**



1. An eyepiece with a wide field of view, comprising:

a positive meniscus lens with a convex surface facing an eyepoint side of the eyepiece,

a bonded biconvex lens having a biconvex lens and a negative meniscus lens with a concave surface facing an object side of the eyepiece and a bonded surface of said bonded biconvex lens having negative refractivity,

a positive lens with a convex surface facing the object side of the eyepiece, and

said positive meniscus lens being closest to said object side, said positive lens being furthest from said object side, and said bonded biconvex lens being intermediate said positive meniscus lens and said positive lens,

wherein the following conditions are met:

$$0.10 < d1/F < 0.26;$$

$$0.20 < (r1-r2)/(r1+r2) < 0.58;$$

$$1.0 < (n1-1)\ r1/r2 < 2.6,$$

$$-0.45 < (n3-n2)\ F/r4 < -0.25;$$

$$-0.12 < F/r7 < 0.17;\ \text{and}$$

$$-0.1 < r6/r7 < 0.16,$$

where d1 is an on-axis thickness of said positive meniscus lens; F is the focal length of the overall eyepiece; r1 is a radius of curvature of an object-side surface of said positive meniscus lens; r2 is a radius of curvature of the convex surface of said positive meniscus lens; r4 is a radius of curvature of the bonded surface of said bonded biconvex lens; r6 is a radius of curvature of an object-side surface of said positive lens; r7 is a radius of curvature of an eyepoint-side surface of said positive lens; n1 is a refractive index of said positive meniscus lens with respect to a d-line; n2 is a refractive index of said biconvex lens with respect to a d-line, and n3 is a refractive index of said negative meniscus lens with respect to a d-line.

5,815,318

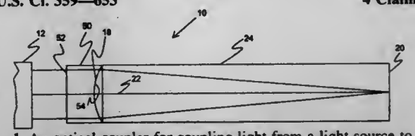
AXIALLY-GRADED INDEX-BASED COUPLERS

Joseph R. Dempewolf, Taos, and Robert K. Wade, Albuquerque, both of N. Mex., assignors to LightPath Technologies, Inc., Albuquerque, N. Mex.

Filed Oct. 31, 1996, Ser. No. 739,860

Int. Cl.[6] G02B *3/00*

U.S. Cl. 359—653 **4 Claims**



1. An optical coupler for coupling light from a light source to a light collector, said optical coupler comprising a single component having a plano light entrance surface and a plano light exit surface and an optical axis therebetween, said single component including at least one axially graded index of refraction element, wherein said single component comprises a mono-axially graded index of refraction element having a convex, spherical entrance surface and a plano exit surface and said optical axis therebetween, with a homogeneous glass blank having a plano entrance surface and a concave, spherical surface matched to said convex, spherical surface, said spherical surfaces joined together, said component having a length from its entrance surface to its exit surface such that light incident on said entrance surface is focused to a point on said exit surface.

5,815,319

Patent Not Issued For This Number

5,815,320

ZOOM LENS

Kouji Hoshi; Takeshi Koyama; Yoshinori Itoh; Makoto Misaka, and Akihiro Nishio, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 177,603, Jan. 3, 1994, abandoned. This application Feb. 12, 1997, Ser. No. 799,403

Claims priority, application Japan, Jan. 14, 1993, 5-005021; Jan. 14, 1993, 5-005023; Jan. 25, 1993, 5-029922; Feb. 24, 1993, 5-035559; Feb. 25, 1993, 5-036588

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—686 **35 Claims**

1. A zoom lens comprising, from front to rear, a first lens unit of positive refractive power, a second lens unit, a third lens unit of positive refractive power, and a fourth lens unit of negative refractive power, separations between said lens units being varied to effect zooming,

wherein said zoom lens satisfies the following condition:

$$M_1 = M_2 = 1,$$

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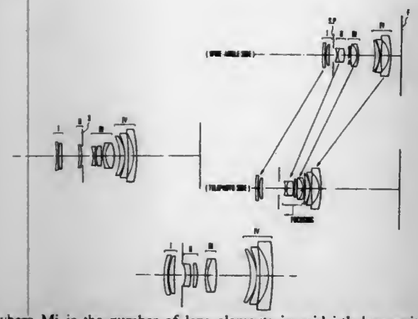


where Mi is the number of lens elements in said i-th lens unit, wherein, for a cemented lens, its constituent elements are counted as if in broken contact, and

wherein said first lens unit moves at the time of zooming.

5,815,321

ZOOM LENS SYSTEM

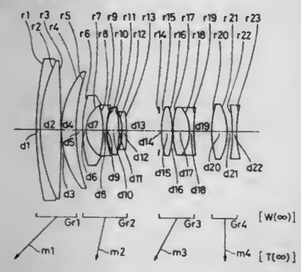
Mitsuaki Shimo, Osaka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 2, 1996, Ser. No. 726,312

Claims priority, application Japan, Oct. 6, 1995, 7-260147; Oct. 6, 1995, 7-260154

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—687 **33 Claims**



1. A method of focusing in a zoom lens system which comprises a plurality of lens units and in which at least a first lens unit arranged at a most object-side is moved during zooming, comprising:

a step of arranging, from an object-side end, a first positive lens unit and a first negative lens unit, and further arranging at least a second positive lens unit at an image-surface side of said first negative lens unit, and arranging a third positive lens unit at said image-surface side of said second positive lens unit; and

a step of moving said first negative lens unit while varying a distance between said second and third positive lens units arranged at said image-surface side of said first negative lens unit during focusing so that the third positive lens unit is moved toward an image-surface side.

5,815,322

ZOOM LENS SYSTEM HAVING HIGH ZOOM RATIO

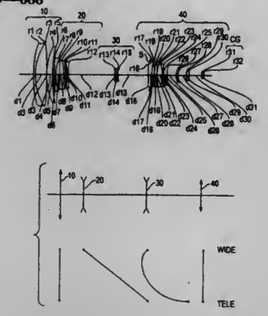
Takashi Enomoto, and Takayuki Ito, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1997, Ser. No. 907,411

Claims priority, application Japan, Aug. 12, 1996, 8-212652

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—688 **5 Claims**



1. A zoom lens system comprising a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having negative refracting power, and a fourth lens groups having positive refracting power, arranged in this order from the object side, wherein the second and third lens groups are moved during zooming while the first and fourth lens group are stationary during zooming, and wherein the following condition is satisfied:

$$2.73 \leqq (D_{3w} - D_{3T})/f_w < 6$$

wherein D_{3w} represents the distance between the third lens group and the fourth lens group at the short focal length extremity, D_{3T} represents the distance between the third lens group and the fourth lens group at the long focal length extremity, and f_w represents the focal length of the entire zoom lens system at the short focal length extremity.

5,815,323

FAST ASPHERICAL ZOOM LENS SYSTEM

Tetsuya Abe, Sapporo Hokkaido; Takayuki Ito, and Takashi Enomoto, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1997, Ser. No. 907,413

Claims priority, application Japan, Aug. 12, 1996, 8-212653

Int. Cl.[6] G02B *15/14;13/18*

U.S. Cl. 359—688 **3 Claims**

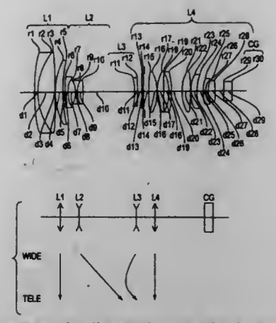
1. A fast aspherical zoom lens system comprising a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having negative refracting power, and a fourth lens group having positive refracting power, arranged in this order from the object side, and further comprising at least one aspherical surface in said first through fourth lens groups, said second and third lens groups being moved during zooming, wherein said aspherical surface is located at a position in which the following conditions is satisfied:

$$H_{ASP}/H_{MAX} < 0.35$$

$$5 < L_{F\text{-}ASP}/f_w < 10$$

wherein H_{MAX} represents the height of the paraxial ray furthest from the optical axis at the long focal length extremity for all lens surfaces,

H_{ASP} represents the height of the paraxial ray to the aspherical surface at the long focal length extremity,



$L_{F\text{-}ASP}$ represents the distance between the first surface at the object side and the aspherical surface, along the optical axis, and

f_w represents the focal length at the short focal length extremity.

5,815,324

ZOOM LENS SYSTEM FOR A LENS SHUTTER CAMERA

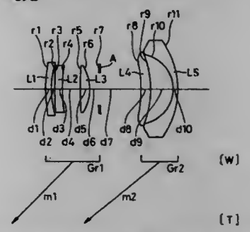
Yasushi Yamamoto, Kishiwada, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 11, 1996, Ser. No. 712,257

Claims priority, application Japan, Sep. 19, 1995, 7-239632; Oct. 5, 1995, 7-258571; Feb. 14, 1996, 8-026608; Feb. 14, 1996, 8-026609; Aug. 23, 1996, 8-222426

Int. Cl.[6] G02B *15/14;3/02*

U.S. Cl. 359—692 **18 Claims**



1. A zoom lens system comprising, from an object-side end:

a first lens unit having a positive refractive power and consisting of one lens element, said first lens unit being provided at a most objective-side end of the zoom lens system; and

a second lens unit having a negative refractive power and consisting of two lens elements, wherein, during zooming from a shortest-focal length state to a longest-focal length state, a distance between said first and second lens unit is decreased.

5,815,325

OPTICAL ASSEMBLY WITH DRIVE LINKAGE FOR A MOVABLE LENS ELEMENT

Dean A. Johnson, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1996, Ser. No. 741,995

Int. Cl.[6] G02B *15/14*

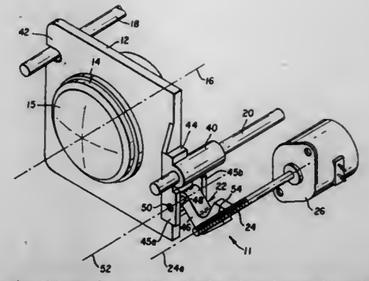
U.S. Cl. 359—696 **14 Claims**

1. A lens assembly, comprising:

a lens barrel assembly for supporting a lens;

one or more guide members for guiding the movement of the lens barrel assembly in the direction of an optical axis;

a gear shaft rotatable by a primary mover; and



a drive linkage for coupling the lens barrel assembly with the gear shaft, said drive linkage including a portion at one end attached to the lens barrel assembly and a drive nut portion at the other end and a compliant central section joining the respective ends, said drive nut portion meshing with the gear shaft over a threaded partial circumference section thereof and movable in the direction of the optical axis by the rotation of the gear shaft to thereby move the lens barrel assembly in the direction of the optical axis, said compliant central section permitting a deformable coupling between the lens barrel assembly and the gear shaft so that the drive nut portion fully engages the lead screw without producing binding torques between the lens barrel assembly and the primary mover.

5,815,326

IMAGE DISPLAY APPARATUS

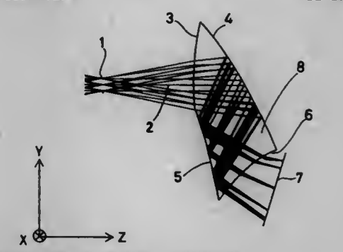
Koichi Takahashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,316

Claims priority, application Japan, May 26, 1995, 7-127896

Int. Cl.[6] G02B *13/10;17/00;27/14*

U.S. Cl. 359—729 **22 Claims**



1. An image display apparatus, comprising:

an image display device for displaying an image; and

an ocular optical system for projecting the image displayed by said image display device and leading the projected image to an observer's eyeball,

said ocular optical system having at least four surfaces which include, in order in which light rays pass in backward ray tracing from said observer's eyeball to said image display device, a first surface which is a refracting surface, a second surface which is a reflecting surface of positive power facing said first surface and decentered with respect to an observer's visual axis, a third surface which is a reflecting surface facing said second surface and decentered with respect to the observer's visual axis that has been reflected by said second surface, and a fourth surface which is a refracting surface closest to said image display device,

said four surfaces forming a prism, said prism being arranged such that a bundle of light rays emitted from said image display device passes through said prism and is led to a center and a periphery of a pupil of said observer's eyeball,

wherein:

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at least two of said at least four surfaces have a finite curvature radius;

a space formed by said first to fourth surfaces is filled with a medium having a refractive index larger than 1;

said two reflecting surfaces are disposed such that a principal ray extending from said observer's eyeball to said image display device does not intersect its own path in said ocular optical system; and

a first-order image of said image display device is formed on a retina of said observer's eyeball.

5,815,327

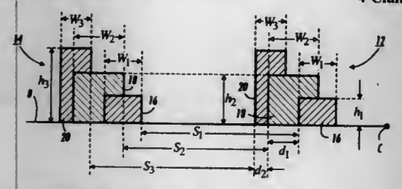
PHOTOLITHOGRAPHIC METHOD OF FABRICATING FRESNEL LENSES

Kaiser H. Wong, Torrance, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1997, Ser. No. 818,189

Int. Cl.[6] G02B *3/08*

U.S. Cl. 359—742 **4 Claims**



1. A fresnel lens comprising:

A) a substrate,

B) a plurality of annular rings, each ring having a plurality of steps, each step having an inner wall and an outer wall, and an upper surface, each step being consecutively numbered from 1 through n inclusive wherein n is at least two and the step numbered 1 is the first step and the step numbered n is the nth step,

C) wherein the first step is on the substrate, and

D) wherein the nth step is at least partially on the upper surface of the n-1th step such that the outer wall of said nth annular step is offset from the outer wall of said n-1th annular step in an outward radial direction.

5,815,328

LENS ACTUATOR AND OPTICAL DISK APPARATUS

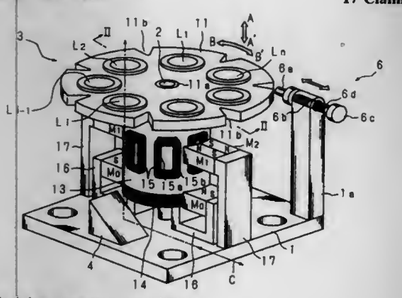
Akihiko Makita, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1996, Ser. No. 638,221

Claims priority, application Japan, Sep. 14, 1995, 7-237317

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—824 **17 Claims**



1. A lens actuator, comprising:

a lens holder for holding a plurality of objective lenses which have different optical characteristics from each other;

a parallel drive unit for moving the lens holder along an axis which is parallel to optical axes of the objective lenses; and

a multiple use drive unit for rotating the lens holder about said axis so as to move the objective lenses in a direction which is perpendicular to the optical axes of the objective lenses, thereby switching an objective lens to a predetermined position, and for fine positioning of said objective lens,

wherein said objective lenses are disposed on a circumference whose center coincides with said axis on the lens holder.

5,815,329

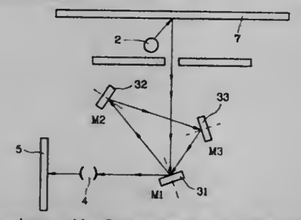
TRI-MIRROR MULTI-REFLECTION OPTICAL PATH FOLDING APPARATUS

Wen-Tso Tseng, Tai Chung, Taiwan, assignor to Umax Data Systems, Inc., Hsinchu, Taiwan

Filed Sep. 13, 1996, Ser. No. 712,588

Int. Cl.[6] G02B *5/08;17/00*

U.S. Cl. 359—861 **9 Claims**



1. A tri-mirror multi-reflection optical path folding apparatus for optical scanner comprising:

a light source for providing light to a scanned object;

a reflection means including a first reflection mirror M1, a second reflection mirror M2, and a third reflection mirror M3 for reflecting the light to a desired direction;

a lens set for converging the light coming from the reflection means into a light image;

a charged coupled device for converting the light image to digital signals for computer storing and processing; and

a base for holding all aforesaid elements; wherein the mirrors M1, M2 and M3 are so positioned that at least one of the mirrors thereof reflects light two times and total reflection times of an optical path originating from the light source is four or five times but does not include the light path of the light source→M1→M2→M1→→M3→the lens set.

5,815,330

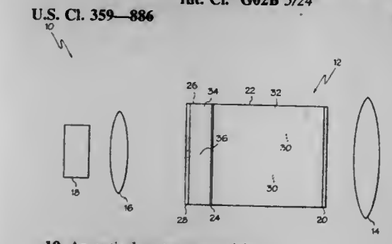
RADIATION LIMITER AND OPTICAL SYSTEM INCORPORATING THE SAME

Roger Jackson Becker, Kettering, Ohio, assignor to The University of Dayton, Dayton, Ohio

Filed Jul. 11, 1997, Ser. No. 893,838

Int. Cl.[6] G02B *5/24*

U.S. Cl. 359—886 **19 Claims**



19. An optical system comprising:

an entry window and an exit window defining a radiation path extending from said entry window to said exit window;

a radiation transmissive membrane positioned along said radiation path between said entry window and said exit window, said membrane defining a first chamber between said entry window and said membrane and a second chamber between said membrane and said exit window;

a first fluid included within said first chamber so as to intersect said radiation path;

a second fluid included within said second chamber so as to intersect said radiation path;

a first lens operative to focus radiation directed through said entry window at a focal point located within said second fluid;

a second lens operative to focus radiation passing through said exit window.

5,815,331

DIGITAL SIGNAL RECORDING METHOD AND APPARATUS INVOLVING PRECODE PROCESSING FOR PARTIAL RESPONSE DETECTION

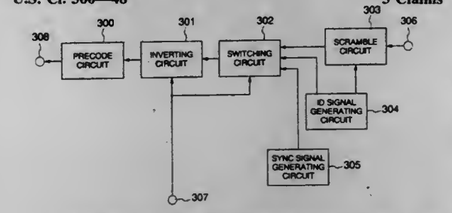
Hiroo Okamoto; Kyoichi Hosokawa; Hitoaki Owashi, and Takaharu Noguchi, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1996, Ser. No. 620,687

Claims priority, application Japan, Mar. 28, 1995, 7-069141

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—48 **3 Claims**



1. A digital signal recording method for recording an input digital signal on a recording medium after precoding said digital signal comprising the steps of:

dividing said input digital signal at a certain byte number, and adding to each of said divided signals an error detection and correction code to form a succession of signal blocks;

generating a synchronization signal and a control signal including block address information for each signal block;

scrambling the digital signal and error detection and correction code of each signal block on the basis of said block address information;

adding said synchronization signal and said control signal including said block address information to each scrambled signal block;

inverting at least said control signal of each of said signal blocks;

precoding said scrambled digital signal and error detection and correction code, the synchronization signal, and the control signal from said inverting step; and

recording each of precoded signals from said precoding step, on said recording medium.

5,815,332

HAVING IMPROVED SERVO COMPENSATION AND METHOD FOR SAME

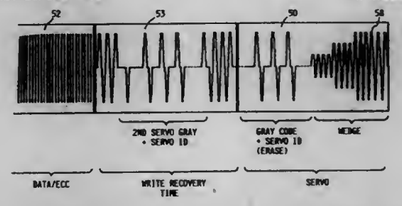
Hiroaki Suzuki, Fujisawa; Kenji Ogasawara, Kanagawa-ken; Masaharu Kawamura, Zama, and Koji Kurachi, Yokohama, all of Japan, assignors to International Business Machines Coporation, Armonk, N.Y.

Filed Mar. 29, 1996, Ser. No. 623,943

Claims priority, application Japan, Mar. 31, 1995, 7-075149

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—48 **5 Claims**



1. An information recording disk having data tracks concentrically formed thereon, comprising;

(a) data regions having data recorded therein;

(b) servo regions, separately formed from the data regions along the track direction of the disk, having head position information recorded therein; and

(c) a write recovery area for ensuring a time delay needed for changing from a write mode to a read mode is provided between said data region and said servo region, the write recovery area being configured to record a servo compensation signal for compensating part of the servo information recorded in said servo region.

5,815,333

MAGNETIC DISC WITH A FLAT RAM AREA AND DISC DEVICE

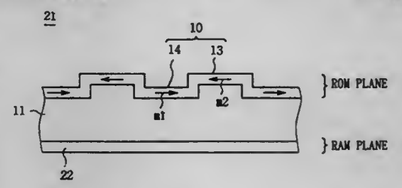
Noriyuki Yamamoto, Tokyo, and Hiroaki Yada, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1995, Ser. No. 579,551

Claims priority, application Japan, Dec. 28, 1994, 6-339562

Int. Cl.[6] G11B *19/04*

U.S. Cl. 360—60 **27 Claims**



1. A magnetic disc wherein:

a plurality of tracks are provided, each track is divided into a plurality of segments and each segment is divided into servo areas to record servo information and data recording areas to record data information; and

said servo areas and first data recording areas for read only are provided at least on one surface on one disc or a plurality of discs stacked upon each other, and second data recording areas to write and read data which are formed by a flat magnetic layer are provided on the other surface of the one disc or each of the plurality of discs.

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5,815,334

DIGITAL SIGNAL DETECTOR FOR CORRECTING SIGNALS OF A MAGNETIC RECORDING/ REPRODUCING DEVICE

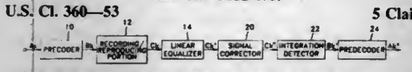
Yong-Deok Chang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jun. 24, 1996, Ser. No. 668,819

Claims priority, application Rep. of Korea, Oct. 24, 1995, 95-36862

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—53 **5 Claims**



1. A digital signal detector for a magnetic recording/reproducing device, comprising:

a precoder for converting an input digital signal into a non-return-to-zero-inverter (NRZI) waveform signal;

a recording/reproducing portion for recording the signal output from said predecoder and reproducing the recorded signal;

a linear equalizer for compensating an amplitude distortion of the signal reproduced by said recording/reproducing portion;

a signal corrector for correcting a signal output from said linear equalizer using a correlation process and producing a corrected signal;

an integration detector for integrating the corrected signal produced by said signal corrector; and

a predecoder for decoding the signal integrated by said integration detector into an original signal, wherein, in said signal corrector, if present and previous values of the signal output from said linear equalizer are both positive, the smaller of the present and previous values is corrected to "0"; and if a negative signal value of the signal output from said linear equalizer is followed by another negative value, the larger of the two negative values is corrected to "0", wherein said signal corrector uses the correlation process, said correlation process being based upon a differentiation feature of said recording/reproducing portion, to perform the corrections to "0".

5,815,335

RECORDING AND REPRODUCING APPARATUS WITH MECHANICAL ADJUSTMENT DATA STORED IN MEMORY ON MECHANICAL MECHANISM ASSEMBLY

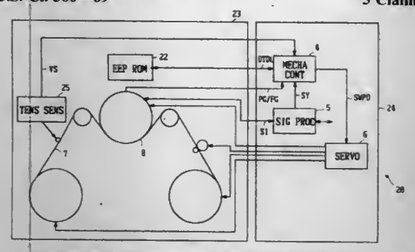
Hiroshi Nishimura, Saitama, and Koichi Tanaka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 531,340, Sep. 20, 1995, abandoned, which is a continuation of Ser. No. 156,848, Nov. 24, 1993, abandoned. This application Mar. 19, 1997, Ser. No. 822,544

Claims priority, application Japan, Dec. 2, 1992, 4-350306

Int. Cl.[6] G11B *15/18*

U.S. Cl. 360—69 **5 Claims**



1. A recording and reproducing apparatus for recording to and reproducing from a tape-shaped recording medium, said apparatus comprising:

a first assembly including a mechanism portion having mechanical mechanism parts and electromechanical parts for advancing said tape-shaped medium in the recording and reproducing apparatus, recording predetermined data on the recording medium, reproducing data recorded on the recording medium, and for sensing a tension of the recording medium and having

electronic memory means for storing individual adjusting data relating to operating characteristics specific to said mechanism portion for controlling said mechanical mechanism parts and said electromechanical parts to operate with predetermined operating characteristics and for storing management data related to a history of a production, an improvement and an operation of said mechanical mechanism parts, said adjusting data being stored into said memory means during an adjusting stage of assembling said first assembly, and said first assembly being void of electronic circuits other than said memory means and said electromechanical parts;

a second assembly separably arranged from said first assembly and including operating circuits and a control circuit portion for outputting control signals for controlling said mechanical mechanism parts and said electromechanical parts of said mechanism portion on the basis of said adjusting data stored in said memory means, said second assembly containing electronic circuits separably connected to said first assembly containing said mechanism portion and said memory means; and

a signal line for communicating said adjusting data and said management data between said memory means and said control portion, and supplying said control signals from said control portion to said mechanism portion.

5,815,336

METHOD FOR SENSING POSITION OF MAGNETIC TAPE DURING DISCONTINUOUS TRAVEL OF THE TAPE

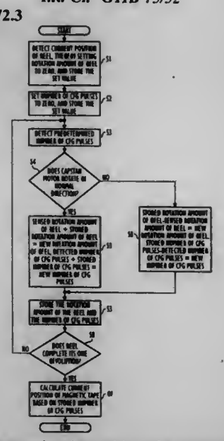
Sang Soo Yim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Sep. 6, 1996, Ser. No. 709,031

Claims priority, application Rep. of Korea, Sep. 7, 1995, 1995-29420

Int. Cl.[6] G11B *15/52*

U.S. Cl. 360—72.3 **5 Claims**



1. A method for sensing the position of a magnetic tape during a discontinuous travel of the magnetic tape in a video cassette recorder, the video cassette recorder including a capstan motor for feeding the magnetic tape in the video cassette recorder at a constant speed, a capstan motor frequency generator for generating a pulse signal having a value determined in accordance with a rotating operation of the capstan motor, a reel sensing unit for sensing a rotated state of a reel on which the magnetic tape is wound, and a microprocessor provided with a storage medium, the microprocessor serving to control the rotating operation of the capstan motor while detecting the number of pulses generated from the capstan motor frequency generator per revolution of the reel, thereby sensing the current position of the magnetic tape, the method comprising the steps of:

(a) counting a predetermined number of pulses generated from the capstan motor frequency generator;

(b) checking the rotating direction of the capstan motor and, depending on the rotating direction of the capstan motor, performing one of:

adding the detected number of pulses to a stored number of pulses and

deducting the detected number of pulses from the stored number of pulses; and

(c) calculating the current position of the magnetic tape based on the number of pulses obtained by the computation executed at step (b).

5,815,337

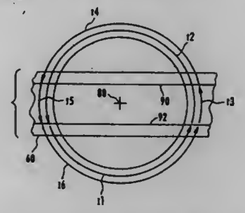
TAPE DRIVE HAVING AN ARCUATE SCANNER AND A METHOD FOR CALIBRATING THE ARCUATE SCANNER

Richard K. Milo, Lake Forest, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Oct. 24, 1995, Ser. No. 547,270

Int. Cl.[6] G11B *21/10*

U.S. Cl. 360—75 **21 Claims**



1. A method of positioning an arcuate scanner head assembly relative to a recording tape in an arcuate scanner, the arcuate scanner head assembly having a rotatable drum and a plurality of scanner heads on the drum, the method comprising:

rotating the drum and the plurality of scanner heads thereon about an axis of rotation;

causing the recording tape to move past the rotating drum, such that at least two contact zones exist between the drum and the recording tape, the recording tape having at least a fist readable calibrating stripe extending longitudinally along a length of the recording tape to define at least a first zone on one side of the calibrating stripe and a second zone on the other side of the calibrating stripe;

measuring a first transit time for a scanner head rotating through the first zone and a second transit time for the scanner head rotating through the second zone by identifying when the scanner head passes over the calibrating stripe;

comparing the first and second transit times to determine an amount of pointing error of the arcuate scanner head assembly based on a position of the scanner head with respect to the calibrating stripe on the recording tape; and

correcting a pointing of the arcuate scanner head assembly with respect to the recording tape to reduce the amount of pointing error to a specified level.

5,815,338

APPARATUS AND METHOD OF DETECTING HEAD POSITION ERROR IN MAGNETIC DISK DRIVE

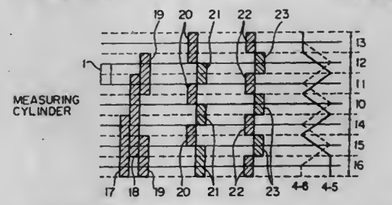
Masao Tsunekawa; Mutsumi Takemoto, both of Kawasaki, and Harumi Seino, Higashine, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 956,069, Oct. 2, 1992, abandoned. This application Apr. 11, 1995, Ser. No. 419,840

Claims priority, application Japan, Oct. 3, 1991, 3-255632

Int. Cl.[6] G11B *5/596*

U.S. Cl. 360—77.04 **10 Claims**



1. An apparatus for detecting a position error distance of a data head in a disk apparatus with respect to the center of a measuring cylinder by reading servo burst patterns recorded on a data surface of a disk, on either side of a center of the measuring cylinder, the measuring cylinder being a dedicated servo data cylinder which does not store user data, said apparatus comprising:

means for reading a plurality of kinds of said servo burst patterns from a plurality of contiguous servo data cylinders storing a plurality of kinds of contiguous servo data, and which are located on both outer and inner peripheral sides of the center of the measuring cylinder, wherein said outer and inner peripheral sides are defined with respect to a radial direction of concentric circles formed by all the cylinders;

means for detecting a rough position error distance of the data head from the measuring cylinder on the basis of the combination of parts of a plurality of kinds of said servo burst patterns;

means for detecting a detailed position error distance of the data head on the basis of the combination of other parts of a plurality of kinds of said servo burst patterns; and

means for determining an accurate position error distance by comparing and totaling said rough position error distance and said detailed position error distance.

5,815,339

CYLINDER MOTOR APPARATUS

Michio Inui; Shuuji Ohmura, and Akinobu Koba, all of Saitama-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 626,687, Apr. 2, 1996, abandoned, which is a continuation of Ser. No. 314,506, Sep. 28, 1994, abandoned. This application Oct. 17, 1996, Ser. No. 734,390

Claims priority, application Japan, Sep. 28, 1993, 5-241659; Dec. 27, 1993, 5-331702

Int. Cl.[6] G11B *5/52*

U.S. Cl. 360—85 **15 Claims**

1. A cylinder motor apparatus comprising:

a chassis;

a shaft;

a circuit board;

a supporting member for supporting the shaft on the chassis in a freely rotatable state;

a rotor fixed to the shaft wherein the rotor has a stator housing defined into a circular concave shape facing in a direction axially away from the supporting member; a magnet being provided in the stator housing;

the stator housing having an inner circular wall, an outer circular wall coaxial to said inner circular wall and a base wall extending between said inner and outer circular walls and

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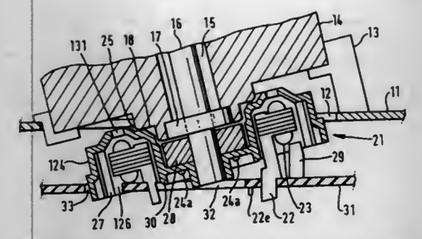


defining therewith said concave shape of the stator housing, said inner and outer walls protecting from the base wall generally axially away from the support member, said inner wall being laterally spaced from said shaft, said stator housing further comprising a projection extending from the inner wall, coaxially with the inner wall, axially beyond the extent of said outer wall;

a stator housed in the stator housing and fixed to the circuit board; and

an electric circuit provided on the circuit board for controlling the rotation of the rotor.

5,815,340

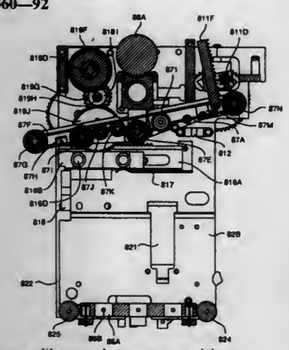
APPARATUS AND METHODS FOR CARTRIDGE RETRIEVAL AND INSERTION IN A STORAGE LIBRARY SUBSYSTEM INCLUDING A ROBOTIC SHUTTLE HAVING A SOLE ROCKER BEAM

John A. Barkley, Longmont; Stephen Ward Graeber, Louisville, and Robert John Schaefer, Boulder, all of Colo., assignors to Breece Hill Technologies, Inc., Boulder, Colo.

Filed Nov. 25, 1996, Ser. No. 755,791

Int. Cl.[6] G11B *15/68*

U.S. Cl. 360—92 **18 Claims**



17. A storage library subsystem comprising:

a frame;

a media read/write device attached to said frame;

at least one removable storage media cartridge magazine attached to said frame, said storage media cartridge magazine having at least one slot for storage of a storage media cartridge;

at least one non-removable storage media cartridge magazine attached to said frame, said non-removable storage media cartridge magazine having at least one slot for storage of a storage media cartridge;

robotic shuttle means for moving said storage media cartridge between said media read/write device and said slot from said removable storage media cartridge magazine and non-removable storage media cartridge magazine, said robotic shuttle means comprising:

a shuttle frame with a front and rear port for receipt and ejection of storage media cartridges; and

a sole rocker beam pivotably attached to said shuttle frame wherein said rocker beam is a single member that pivots substantially about its center, and wherein said rocker beam has a first end protruding out said front port and a second end protruding out said rear port, and wherein rotation of said rocker beam in a clockwise and counterclockwise direction is operable for positioning said rocker beam to move said storage media cartridge into and out of said front and rear ports; and

a drive belt to move said robotic shuttle means transversely in said frame.

5,815,341

CASSETTE HOLDER LOCKING APPARATUS FOR VIDEO CASSETTE TAPE RECORDER

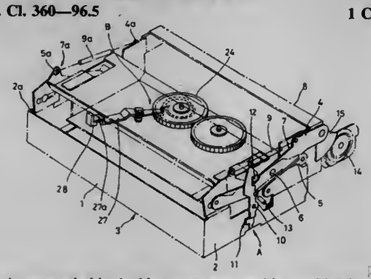
Haksun Hwang; Inki Cheon, both of Seoul; Sang Jig Lee, Kyungki-Do; Pohyoung Koh, Kyungki-Do; Hyeoksoo Park, Kyungki-Do, and Sungwoo Choi, Kyungki-Do, all of Rep. of Korea, assignors to LG Electronics, Inc., Seoul, Rep. of Korea

Continuation of Ser. No. 559,487, Nov. 15, 1995, abandoned. This application Mar. 17, 1997, Ser. No. 819,202

Claims priority, application Rep. of Korea, Nov. 15, 1994, 30196/1994

Int. Cl.[6] G11B *5/027*

U.S. Cl. 360—96.5 **1 Claim**



1. A cassette holder locking apparatus used in combination with a video cassette tape recorder, said video cassette tape recorder including a housing bracket having a side plate, a cassette holder for receiving a cassette tape, and loading means engaged between said side plate of said housing bracket and the cassette holder for loading the cassette holder, said cassette holder locking apparatus comprising:

first holder locking means which engages a first portion of the cassette holder rotatably disposed to the side plate for limiting a lifting operation of the cassette holder after the cassette holder is lowered and driven by first drive means provided at said cassette holder, and

second holder locking means engaging a second portion of the cassette holder rotatably disposed at a deck surface of an opposite side of the side plate to said first holder locking means and driven by second drive means which drive other parts of the video cassette recorder provided at said deck surface for limiting a lifting operation of the cassette holder;

wherein said first holder locking means is operated prior to said second holder locking means,

wherein said second holder locking means includes:

a loading base having a loading groove;

a loading gear rotatably disposed at said loading base and having a cam groove:

a locking lever rotatably disposed at one side of the loading base and having a cam pin inserted into said cam groove: and

an engaging member disposed at a predetermined lower portion of the cassette holder and selectively engaged by said locking lever, and

wherein the engaging member is selectively engaged by the locking lever only when the loading gear has rotated through a prescribed angle to effect a tape loading operation and after the cassette holder is at a lowermost loading position.

5,815,342

PERPENDICULAR MAGNETIC RECORDING/ REPRODUCING APPARATUS

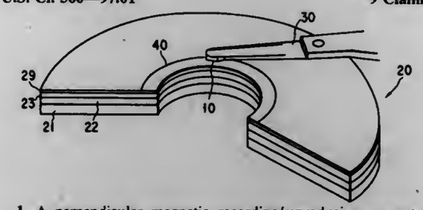
Junichi Akiyama, and Yoichiro Tanaka, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 90,312, Jul. 13, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 558,971

Claims priority, application Japan, Jul. 13, 1992, 4-184254; Aug. 26, 1992, 4-226582

Int. Cl.[6] G11B *5/66*

U.S. Cl. 360—97.01 **9 Claims**



1. A perpendicular magnetic recording/reproducing apparatus comprising:

perpendicular magnetic recording medium having a substrate, a first metal magnetic layer formed on said substrate and a second metal magnetic layer formed over said first metal magnetic layer and having a perpendicular magnetic anisotropy; and

magnetic head having at least one magnetic field generating element for applying a magnetic field to a given region of said first metal magnetic layer at a time of signal reproduction, for reproducing magnetized signals with respect to said second metal magnetic layer of said perpendicular magnetic recording medium with reduced Barkhausen noise.

5,815,343

MAGNETIC RECORDING MEDIUM, PROCESS FOR PRODUCING THE SAME AND MAGNETIC RECORDING SYSTEM

Akira Ishikawa, Kodaira; Yoshihiro Shiroishi, Hachioji; Yuzuru Hosoe, Hino; Yotsuo Yahisa, Odawara; Tomoo Yamamoto, Hachioji; Masukazu Igarashi, Kawagoe; Akira Osaki, Odawara; Yoshiki Kato, Tokyo, and Jun Fumioka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 275,391, Jul. 15, 1994, abandoned. This application Oct. 27, 1997, Ser. No. 967,346

Claims priority, application Japan, Jul. 22, 1993, 5-181015; Sep. 6, 1993, 5-221227

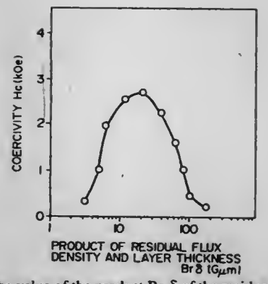
Int. Cl.[6] G11B *5/012;17/00;5/78;5/82*

U.S. Cl. 360—97.01 **62 Claims**

1. A magnetic recording medium for use with a magnetic head, the magnetic head being for recording signals on the magnetic recording medium in a magnetic head travel direction and/or reading recorded signals from the magnetic recording medium in the magnetic head travel direction, the magnetic head travel direction being a direction the magnetic head travels relative to the magnetic recording medium during recording and/or reading as a result of relative motion occurring between the magnetic head and the magnetic recording medium, the magnetic recording medium comprising:

a non-magnetic substrate; and

a magnetic layer provided on the non-magnetic substrate;



wherein the value of the product $Br_1\delta$ of the residual flux density Br_1 of the magnetic layer determined in the magnetic head travel direction and the thickness δ of the magnetic layer is not less than 5 Gμm and not more than 180 Gμm;

wherein the value of the ratio of Br_1 to the residual flux density Br_2 determined in a direction parallel to the substrate plane and perpendicular to the magnetic head travel direction, Br_1/Br_2, is not less than 1.3 and not more than 3;

wherein the surface of the non-magnetic substrate has texture grooves therein; and

wherein the average roughness factor Ra of the surface of the magnetic layer determined in a direction perpendicular to the substrate plane and perpendicular to the magnetic head travel direction is not less than 0.3 nm and not more than 1.9 nm.

5,815,344

DISC CARTRIDGE LOADING APPARATUS

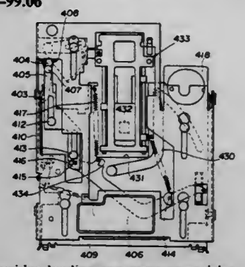
Yoshitaka Aoki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 467,466, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 16,606, Feb. 11, 1993, Pat. No. 5,481,423. This application Apr. 3, 1997, Ser. No. 827,923

Claims priority, application Japan, Feb. 17, 1992, 4-061525; Feb. 17, 1992, 4-061526

Int. Cl.[6] G11B *17/04;33/02*

U.S. Cl. 360—99.06 **11 Claims**



1. A disc cartridge loading apparatus comprising:

a cartridge holder for holding a disc cartridge;

cartridge capturing means including a cartridge capturing member that is slidably mounted on the cartridge holder and having a capturing pin that introduces into and engages with a recess of the disc cartridge, said cartridge capturing member having at least one guide groove formed therein engaged with at least one guide pin protruding from said cartridge holder for causing said capturing pin to be introduced into and engaged in the recess of the disc cartridge, said capturing pin not being contacted with said disc cartridge upon insertion of said disc cartridge into said cartridge holder until said guide groove causes said capturing pin to engage said cartridge holder; and

cartridge capturing operating means for sliding said cartridge capturing means in a disc cartridge insertion direction under the bias of biasing means to capture the disc cartridge into

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said cartridge holder, wherein said biasing means includes a spring provided in a direction substantially at right angles to the direction of insertion of the disc cartridge into said cartridge holder.

5,815,345

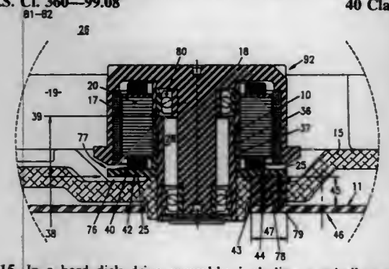
SUPPORT FLANGE HAVING ELECTRICAL CONTACTS TO PROVIDE ELECTRICAL CONTINUITY UPON SPINDLE MOTOR MOUNTING TO BASE

Robert Michael Pelstring, Santa Cruz; Klaus Dieter Kloeppel, Watsonville; John Charles Dunfield, Santa Cruz; Michael Kenneth Andrews, Soquel, and Clifford Thomas Jue, Santa Cruz, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 238,638, May 4, 1994, Pat. No. 5,548,458. This application Jul. 30, 1996, Ser. No. 692,859

Int. Cl.[6] G11B *17/00;* **H02K** *3/00*

U.S. Cl. 360—99.08 **40 Claims**



15. In a hard disk drive assembly, including a spindle motor having an axis and an outside diameter, said spindle motor being mounted on a base and including a stator having windings and wires for coupling thereto and a driver board assembly having motor driver circuitry thereon, apparatus comprising:

a connector mounted in and through the base in near proximity to the spindle motor and having electrical contact elements, the connector being contained within the outside diameter of said spindle motor; and

an electrically non-conductive flange having an axis aligned with the axis of the spindle motor and fixedly mounted to the stator, having an outside diameter substantially the same as the outside diameter of the spindle motor, and having first and second sides, said first side having solder pads thereon for fixed electrical connection to the stator wires, said second side having exposed circuit traces thereon for engaging the electrical contact elements of the connector in non-specific orientation up to 360° around the axis of the flange, said circuit traces being in electrical continuity with said solder pads through said flange;

said electrical contact elements of the connector being electrically coupled to said stator windings when said spindle motor is mounted on said base;

said driver board assembly being electrically coupled to said stator windings by said electrical contact elements of the connector when said driver board assembly is mounted to said base.

5,815,346

TEXTURED SLIDER SURFACE

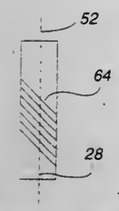
Jay M. Kimmal, Fremont, and Victor Dunn, San Jose, both of Calif., assignors to Maxtor Corporation, Longmont, Colo.

Continuation of Ser. No. 489,407, Jun. 12, 1995, abandoned. This application Apr. 28, 1997, Ser. No. 847,699

Int. Cl.[6] G11B *5/60*

U.S. Cl. 360—103 **10 Claims**

1. A magnetic head apparatus for use in connection with a hard disk in a hard disk drive, comprising:



a magnetic head having a first length defined by a front edge and a rear edge and a width defined by opposite side edges thereof, said first length being aligned with a direction of travel of said magnetic head relative to said disk during operation;

a slider surface, disposed on a bottom of said head adjacent to one of said side edges, for slidably contacting said disk, said slider surface aligned with said first length of said head, said slider surface providing a lifting force to said head during operation, said slider surface having a slider surface length defined by a slider surface front edge and a slider surface rear edge measured along a slider surface longitudinal axis, said slider surface further having a slider surface width defined by opposing slider surface side edges; and

a first plurality of grooves for providing a texture to said slider surface so as to reduce stiction, said first plurality of grooves extending from one slider surface side edge to the other slider sure side edge at an oblique angle to the slider surface longitudinal axis.

5,815,347

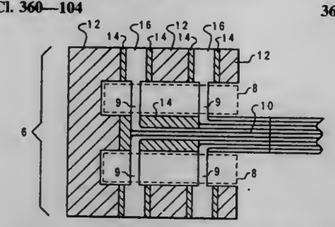
INFORMATION STORAGE SYSTEM HAVING AN IMPROVED PLANAR HEAD-SUSPENSION ASSEMBLY

Surya Pattanaik, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1994, Ser. No. 246,051

Int. Cl.[6] G11B *5/60;21/21*

U.S. Cl. 360—104 **36 Claims**



1. A head-suspension assembly for an information storage system, comprising:

a head having a read and/or write transducer formed therein and electrical leads terminating at termination pads;

a suspension having a conductive lead structure and having one or more openings passing through the suspension, portions of the conductive lead structure projecting into the openings, and the head being placed in contact with the suspension such that the termination pads are properly aligned with the openings; and

a solder region within each of the openings making electrical contact between the conductive lead structure and the termination pads.

5,815,348

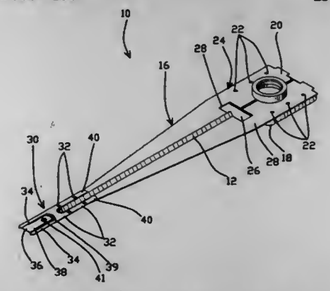
LOAD BEAM WITH INWARD STIFFENING CHANNEL

Reid C. Danielson, Cokato, Minn.; Michael W. Davis, Humboldt, Iowa, and David R. Swift, Glencoe, Minn., assignors to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed Dec. 15, 1995, Ser. No. 572,789

Int. Cl.[6] G11B *5/48*

U.S. Cl. 360—104 **25 Claims**



1. A magnetic head suspension load beam having proximal and distal ends for mounting to a disk drive actuator, the load beam including:

an actuator mounting region on a proximal end of the load beam for mounting the load beam to the actuator;

a rigid region between the actuator mounting region and a distal end of the load beam and having side edges; and

a relief means extending through the actuator mounting region from the proximal end for dividing one portion of said actuator mounting region relative to another and shaping one or more generally longitudinal channels in the rigid region between the side edges of said load beam.

5,815,349

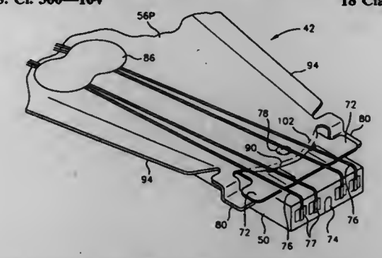
SUSPENSION WITH WIRE PROTECTION WHICH DOES NOT IMPACT SLIDER MOVEMENTS

Norman Kermit Frater, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 531,959, Sep. 21, 1995. This application Feb. 12, 1997, Ser. No. 798,811

Int. Cl.[6] G11B *5/48*

U.S. Cl. 360—104 **18 Claims**



1. A suspension with a low profile wired head gimbal assembly comprising:

an elongated load beam having a central section which is bounded by front and rear end portions and first and second side portions the central section having top and bottom surfaces which define top and bottom planes, the rear end portion of the load beam being mountable to an actuator arm;

a head gimbal assembly including a slider and a flexure, each of the slider and the flexure having top and bottom surfaces which are bounded by front and rear ends and a pair of sides;

the top surface of the slider being mounted to the bottom surface of the flexure and the top surface of the flexure being mounted to the bottom surface portion of the load beam with the front end of the slider being located forward of the front end portion of the load beam;

the mounting of the flexure to the load beam enabling roll and pitch movements of the slider relative to the load beam;

wires connected to the slider and extending rearwardly adjacent to and over the front end portion of the load beam and thence over the top surface of the load beam;

the central section of the load beam having a thickness between said top and bottom surfaces;

said front end portion of the load beam having a forward distal end position with reduced thickness which is less than said thickness of the central section; and

said front end portion having a curved portion which curves downwardly and is located entirely below said top plane, and said reduced thickness of the front end portion being provided by a notch in a bottom side of the front end portion;

so that said wires adjacent the front end portion will not be frayed should the wires engage the front end portion upon said pitch and roll movements of the slider.

5,815,350

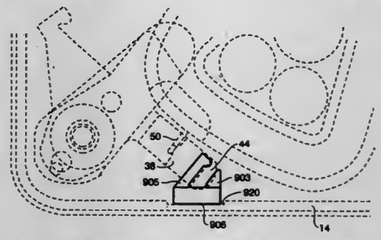
HEAD DISK ASSEMBLY WITH ACTUATOR LATCH VIBRATION DAMPER

Michael John Kennedy, Los Gatos; Marty McCaslin, Pleasanton, and Keith Mayberry, Mountain View, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Apr. 1, 1997, Ser. No. 831,988

Int. Cl.[6] G11B *5/54;21/22*

U.S. Cl. 360—105 **6 Claims**



1. A head disk assembly for a hard disk drive, the head disk assembly comprising:

an enclosure having a base;

a disk having a recording surface;

a pivot bearing cartridge including a shaft fixed to the enclosure;

a head stack assembly connected to the pivot bearing cartridge for rotation relative to the shaft;

the recording surface including an annular landing zone;

the head stack assembly including a head supported to be moved radially relative to the recording surface and to be brought to rest at a position in the landing zone;

the base having a plurality of interior-facing surfaces including a major interior-facing surface parallel to the recording surface;

one of the interior-facing surfaces defining a bearing surface;

a unitary crash stop member having a mounting portion, a latch-supporting cantilevered arm extending parallel to the major interior surface, and a latch-supporting post supported by the latch-supporting cantilevered arm;

a vibration damping member located between the latch-supporting post and the bearing surface;

magnetic engaging means supported by the latch-supporting post, the magnetic engaging means including an engaging end oriented to abut a plane perpendicular to the major interior-facing surface;

the head stack assembly also including a tang having a tang surface for abutting the engaging end to provide an inner crash stop and latch; and

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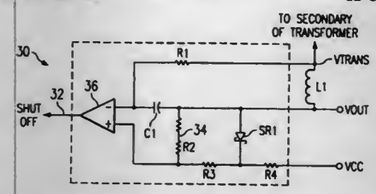
means for affixing the unitary crash stop member to the base such that a portion of the latch supporting post compresses the vibration damping member against the bearing surface.

5,815,351

OVERLOAD PROTECTION CIRCUIT USING A NO-TRIM CIRCUIT FOR COMPUTER POWER SUPPLIES

Gerard Ashok, Austin, and Fred M. Henegar, Georgetown, both of Tex., assignors to Dell Computer Corporation, Round Rock, Tex.

Filed Jul. 21, 1997, Ser. No. 897,770
Int. Cl.[6] H02H *7/00*
U.S. Cl. 361—18 **12 Claims**



1. A computer comprising:

a power supply including an input for receiving a shut-off signal and an output for driving a first output voltage;

a device for receiving the first output voltage and producing a second output voltage, the difference between the first output voltage and the second output voltage indicating a change in current at the power supply output;

a computer supply voltage derived from the first output voltage; and

an overload protection circuit including:

a comparator having a first and second input terminal, wherein the computer supply voltage is fed into the first input terminal of the comparator and the second output voltage is fed into the second input terminal of the comparator; and

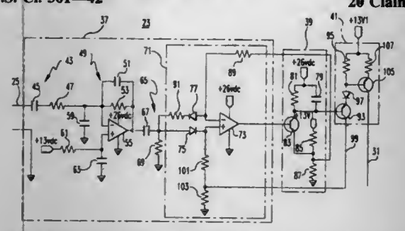
a serially connected resistor and resistive temperature device connected between the first and second input terminals of the comparator.

5,815,352

ARC FAULT DETECTOR WITH LIMITING OF SENSED SIGNAL TO SHAPE RESPONSE CHARACTERISTIC AND CIRCUIT BREAKER INCOPRORATING SAME

Raymond Warren Mackenzie, Pittsburgh, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 29, 1997, Ser. No. 940,132
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—42 **20 Claims**



1. Apparatus for detecting arc faults in an electric power circuit, said apparatus comprising:

sensing means sensing current in said electric power circuit to generate a sensed current signal;

a pulse generator generating a pulse signal containing at least one pulse each time an arc is struck in said electric power circuit;

limiting means limiting amplitude of said pulses in said pulse signal to a predetermined limit value;

means generating a time attenuated accumulation of said pulses in said pulse signal; and

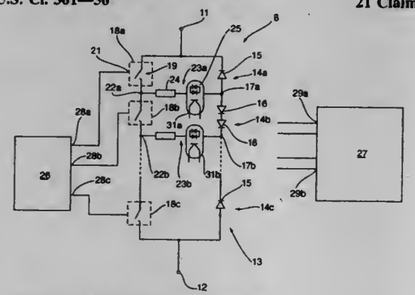
output means generating an arc signal when said time attenuated accumulation reaches a predetermined level.

5,815,353

OVERVOLTAGE PROTECTOR

Hans Dieter Schwenkel, Sturtgart, Germany, assignor to Pilz GmbH & Co., Germany

PCT No. PCT/DE95/01357, § 371 Date Apr. 15, 1997, § 102(e) Date Apr. 15, 1997, PCT Pub. No. WO96/12332, PCT Pub. Date Apr. 25, 1996
PCT Filed Oct. 3, 1995, Ser. No. 817,292
Claims priority, application Germany, Oct. 17, 1994, 44 36 858.5
Int. Cl.[6] H02H *9/00*
U.S. Cl. 361—56 **21 Claims**



1. An overvoltage protector, comprising:

a first and second power terminals,

at least two limiter means connected in series, whose forward d.c. resistance goes to a high value below a predetermined forward voltage and to a low value above said forward voltage, where the series circuit made up of said limiter means is connected between the first and second power terminals, and where the sum of said forward voltages of at least two limiter means serves to define a maximum permissible voltage between the first and second power terminals, while said forward voltage of each individual limiter means is less than a minimum preselected input voltage at the first and second power terminals that is not zero, and

a series circuit of switching devices connected across the first and second power terminals, each of the switching devices having a control input, where the number of switching devices equals the number of limiter means, and each of the switching devices can assume either a high-resistance or low-resistance state, and where each node between adjacent switching devices is interconnected with a corresponding node between adjacent limiter means via an electrical cross link.

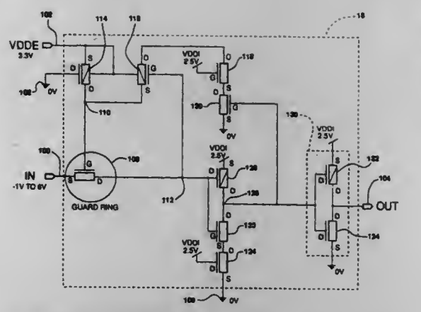
5,815,354

RECEIVER INPUT VOLTAGE PROTECTION CIRCUIT

George Maria Braceras, Colchester; John Connor, Burlington, and Donald Albert Evans, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1997, Ser. No. 821,497
Int. Cl.[6] H02H *9/00*
U.S. Cl. 361—56 **16 Claims**

1. An input circuit for an integrated circuit operating within a first voltage range comprising:



an input for receiving an input signal;

circuit means for protecting said input circuit from voltages of said input signal which are not within said first voltage range, said circuit means comprising:

an NFET pass transistor having a first contact coupled to said input, a second contact coupled to a first node, a third contact coupled to a pass node, and means for passing the voltage of said input signal applied to said first contact to said second contact;

modulation means for modulating the voltage at said pass node in response to the voltage at said first node from a first level, set to protect said pass transistor, to a predetermined limit; and

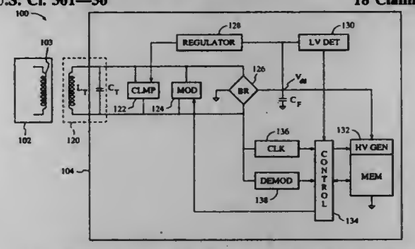
means for clamping the voltage at said first node in response to the voltage at said pass node reaching said predetermined limit to thereby protect devices coupled to said first node.

5,815,355

MODULATION COMPENSATED CLAMP CIRCUIT

Alan M. Dawes, Swindon, United Kingdom, assignor to Atmel Corporation, San Jose, Calif.

Filed Oct. 6, 1997, Ser. No. 944,321
Int. Cl.[6] H02H *9/00*
U.S. Cl. 361—56 **18 Claims**



1. A transponder of the type used in radio frequency identification systems, comprising:

a tank circuit;

an overvoltage circuit connected to the tank circuit having a shunting means for shunting current from the tank circuit during an overvoltage condition; and

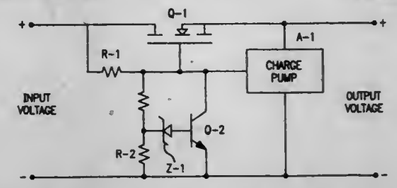
tuning means for varying the tuning of the tank circuit in accordance with data contained in the transponder, the tuning means operatively coupled with the shunting means to vary the amount of current shunted in accordance with the data.

5,815,356

INTEGRATED TRANSIENT SUPPRESSOR

Edward T. Rodriguez, Winchester, and Gary R. Fuchs, Princeton, both of Mass., assignors to Power Micro, Inc., Chelmsford, Mass.

Filed Sep. 26, 1997, Ser. No. 938,145
Int. Cl.[6] H02H *3/20*
U.S. Cl. 361—91 **9 Claims**



1. An integrated electronic protection apparatus for a circuit, said protection apparatus accepting an input voltage and conveying an output voltage to the circuit being protected, said protection apparatus providing protection against input voltage transient spikes and surges from appearing on said output voltage, comprising:

a threshold device for providing a threshold voltage,

means for defining a first voltage limit for the output voltage, the first voltage limit being substantially the maximum that the circuit can withstand, and under which the circuit can continue to operate as designed,

means for relating the first voltage limit to the threshold voltage,

means for defining a second voltage limit, and means for relating the second voltage limit to the threshold voltage,

means for detecting an input voltage rising above the second voltage limit, and

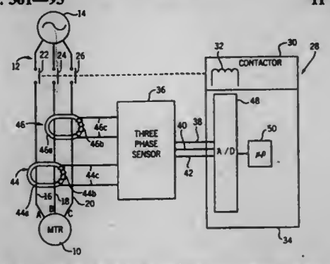
responsive to said detecting, means for limiting said output voltage to said first voltage limit.

5,815,357

METHOD AND APPARATUS FOR THREE-PHASE SENSING USING TWO CURRENT TRANSFORMERS

Mark E. Innes, and John H. Blakely, both of Asheville, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 9, 1997, Ser. No. 831,621
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—93 **11 Claims**



1. A device for monitoring a polyphase system connected to a load comprising:

two current transformers, each in operable association with two legs of the polyphase system wherein each current transformer monitors two phases of the polyphase system and produces a phasor representation of a sum of the two phases monitored; and

a three phase sensor connected to each current transformer to sum the phasor representations produced by each current transformer and produce a third phasor representation therefrom.

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5,815,358

CIRCUIT CONFIGURATION AND SEMICONDUCTOR BODY WITH A POWER SWITCH

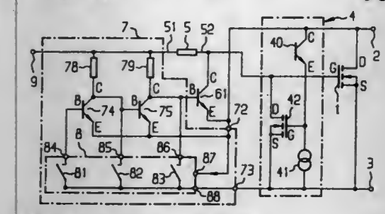
Jenoe Tihanyi, Kirchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 16, 1996, Ser. No. 710,344

Claims priority, application Germany, Sep. 14, 1995, 195 34 160.0

Int. Cl.[6] H02H *5/04*

U.S. Cl. 361—103 **6 Claims**



1. A circuit configuration, comprising:

first and second terminals;

a power switch having a control terminal;

an electronic switch connected between the control terminal and said second terminal for turning off said power switch at excess temperature;

a temperature sensor circuit connected between said first and second terminals and connected to said electronic switch;

a switch device connected between said first terminal and the control terminal; and

a control device connected between said first and second terminals, said control device having an output side connected to said switch device, said control device detecting a voltage between said first and second terminals, said control device comparing said voltage to a predetermined value and closing said switch device if said voltage is below the predetermined value, said switch device in a closed position applying a potential of said control terminal of said power switch to said temperature sensor circuit, and said switch device remaining open if said voltage exceeds the predetermined value.

5,815,359

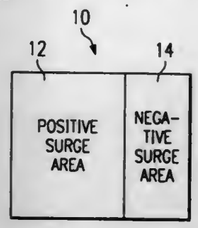
SEMICONDUCTOR DEVICE PROVIDING OVERVOLTAGE PROTECTION AGAINST ELECTRICAL SURGES OF POSITIVE AND NEGATIVE POLARITIES, SUCH AS CAUSED BY LIGHTNING

Michael J. Maytum, Willington, and Kevin Howard, Great Barford, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 525,456, Sep. 8, 1995, abandoned. This application Mar. 21, 1997, Ser. No. 821,492

Int. Cl.[6] H02H *1/00;3/22*

U.S. Cl. 361—111 **8 Claims**



1. A semiconductor device providing overvoltage protection against electrical surges, said semiconductor device comprising:

a substrate having upper and lower major surfaces and being of semiconductor material of one conductivity type;

at least a first dopant region of the opposite conductivity type disposed in said substrate of one conductivity type and opening onto the upper major surface of said substrate;

at least a second dopant region of the opposite conductivity type disposed in said substrate of one conductivity type and opening onto the lower major surface of said substrate said second dopant region being surrounded by semiconductor material of said one conducting type on three sides;

a buried dopant region of the opposite conductivity type disposed in said substrate between said first and second dopant regions of the opposite conductivity type and in spaced relation with respect thereto, said buried dopant region of the opposite conductivity type being arranged at varying depths within said substrate of one conductivity type so as to define first and second thyristor structures in conjunction with the substrate of one conductivity type and the respective first and second dopant regions of the opposite conductivity type and in asymmetrical relation to each other.

5,815,360

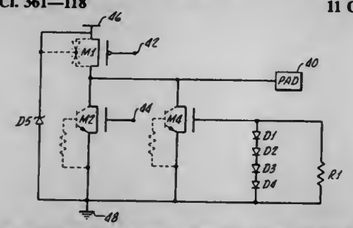
INTEGRATED CIRCUIT INPUT/OUTPUT ESD PROTECTION CIRCUIT WITH GATE VOLTAGE REGULATION AND PARASITIC ZENER AND JUNCTION DIODE

Rosario Consiglio, San Jose, and Gina M. Sparacino, Milpitas, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 180,741, Jan. 12, 1994, Pat. No. 5,594,611. This application Dec. 6, 1996, Ser. No. 761,443

Int. Cl.[6] H02H *1/00*

U.S. Cl. 361—118 **11 Claims**



1. An electro-static discharge protection circuit adapted for use in an integrated circuit comprising:

a first protective field effect transistor connected between a pad of said integrated circuit and a potential of said integrated circuit and having a gate, said first transistor responsive to a voltage applied to said gate to control a current through said first transistor; and

a voltage regulator connected between said gate of said first protective transistor and said potential of said IC, said diode voltage regulator operative to apply said voltage to said gate such that a desired amount of current flows through said first transistor when an electro-static discharge is applied to said pad.

5,815,361

MAGNETIC FIELD SHIELDING DEVICE IN DISPLAY

Sung-Yun Cho, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

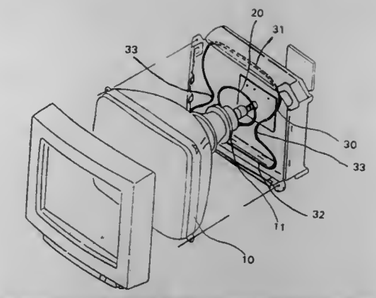
Filed Apr. 3, 1997, Ser. No. 835,056

Claims priority, application Rep. of Korea, Apr. 3, 1995, 1996-10047; Jan. 3, 1997, 1997-27

Int. Cl.[6] H01F *13/00*

U.S. Cl. 361—150 **3 Claims**

1. A magnetic field shielding device of a cathode ray tube display, comprising:



a degaussing coil for preventing a magnetic field, generated by a voltage supplied to a deflection coil of the display, from being emitted from the display; and

a tilt coil disposed at a middle portion of the degaussing coil so as to surround an electron gun of the cathode ray tube, top and bottom portions of the degaussing coil being maintained horizontal, and both sides of its middle portion being bent inward to approach to each other, and having a predetermined distance therebetween, to thereby prevent dark color purity generated at the lower portion of the display.

5,815,362

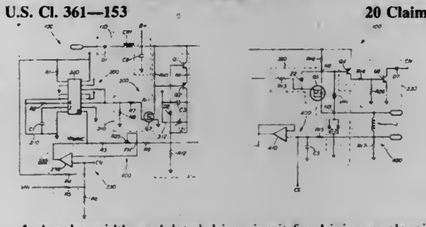
PULSE WIDTH MODULATED DRIVE FOR AN INFINITELY VARIABLE SOLENOID OPERATED BRAKE CYLINDER PRESSURE CONTROL VALVE

Barry J. Kahr, Fountain Inn, and John H. Corvin, Greer, both of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 4, 1996, Ser. No. 759,411

Int. Cl.[6] H01H *47/32*

U.S. Cl. 361—153 **20 Claims**



1. A pulse width modulated drive circuit for driving a solenoid operated valve in response to an input voltage signal from a brake control apparatus, said solenoid operated valve including a coil that is energizable in response to energy received from said drive circuit, said drive circuit comprising:

(a) a pulse generator circuit for receiving said input voltage signal from said brake control apparatus and a feedback signal derived from said coil and for generating in response thereto a pulse width modulated signal whose duty cycle depends thereon;

(b) an output circuit for receiving said pulse width modulated signal from said pulse generator circuit and for generating in response thereto a pulse width modulated output signal whose duty cycle matches that of said pulse width modulated signal through which energy from a source of energy is delivered to said coil so as to control operation of said solenoid operated valve thereby controlling operation of said brake control apparatus; and

(c) a feedback circuit, disposed between said coil and said pulse generator circuit, for generating said feedback signal thereby enabling said pulse generator circuit to adjust said pulse width modulated signal to compensate for variations in energy supplied by said source of energy.

5,815,363

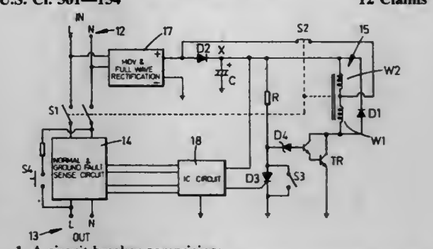
CIRCUIT BREAKER

Raymond Wai Hang Chu, Chai Wan, Hong Kong, assignor to Defond Manufacturing Limited, Chai Wan, Hong Kong

Filed Oct. 1, 1996, Ser. No. 724,468

Int. Cl.[6] H01H *47/06*

U.S. Cl. 361—154 **12 Claims**



1. A circuit breaker comprising:

a pivotable switching member including a pivoting end and a free end;

a main switch for controlling the connection of a load to a power source, the main switch having:

fixed contacts, and

a movable switch contact supported on the free end of the pivotable switching member and resiliently biased away from the fixed contact, wherein the free end of the pivotable switching member pivots to open and close the main switch;

a solenoid having a first winding for initially moving the movable contact towards the fixed contact and a second winding for holding the movable contact against the fixed contact;

a fault detection circuit for detecting a fault at the load and, in response, disabling the solenoid; and

reset means comprising a reset switch for initially energizing the first winding and, when the movable contact is sufficiently close to or reaches the fixed contact, energizing the second winding, the reset switch being mechanically operated by the free end of the pivotable switching member, by virtue of movement of the movable contact, for controlling energization of the first and second windings.

5,815,364

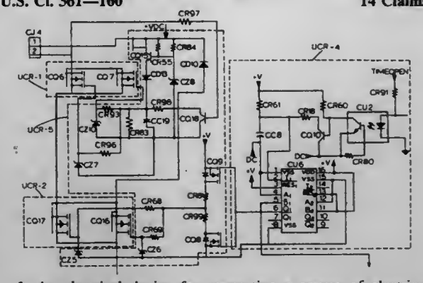
ULTRASONIC COIL CURRENT REGULATOR

Rick A. Hurley, Fletcher, and Mark E. Innes, Asheville, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 18, 1991, Ser. No. 781,480

Int. Cl.[6] H01H *47/02*

U.S. Cl. 361—160 **14 Claims**



1. An electrical device for connecting a source of electrical power to an electrical load comprising:

one or more pairs of separable main contacts;

an electromagnet including an armature mechanically interlocked with said one or more pairs of separable main contacts, said armature movably mounted to allow said one or more

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pairs of separable main contacts to be placed in a CLOSED position or alternatively in an OPEN position, said electromagnet also including a solenoid coil for controlling the movement of said armature;

means for connecting said solenoid coil to a source of electrical power in order to apply electrical current to said solenoid coil;

means for sensing the electrical current applied to said solenoid coil;

means for modulating the sensed electrical current of said sensing means;

means for comparing the modulated sensed electrical current of said modulating means with a predetermined value; and

regulating means cooperating with said comparing means for regulating the electrical current applied to said solenoid coil, said modulating means modulating the sensed electrical current of said sensing means in order to place said separable main contacts in the CLOSED position from the OPEN position, said regulating means for regulating the electrical current applied to said solenoid coil in order to maintain said separable main contacts in the CLOSED position.

5,815,365

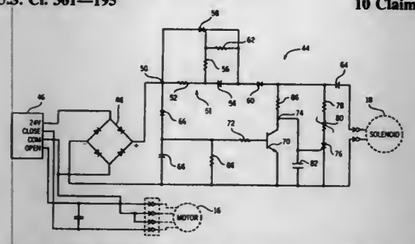
CONTROL CIRCUIT FOR A MAGNETIC SOLENOID IN A MODULATING VALVE APPLICATION

Daniel K. Stege, Wauwatosa, Wis., assignor to Erie Manufacturing Company, Milwaukee, Wis.

Filed Dec. 3, 1996, Ser. No. 759,784

Int. Cl.[6] H01H *47/22*

U.S. Cl. 361—195 **10 Claims**



1. A solenoid control circuit for selectively retracting and extending a magnetically held solenoid, the control circuit comprising:

a power supply circuit connected to a power source and coupled to the magnetically held solenoid for supplying direct current power to operate the magnetically held solenoid;

a power storage device connected to both the power supply circuit and the magnetically held solenoid, the power storage device being charged when the solenoid control circuit is connected to the power source; and

a power discharge bypass connected between the power storage device and the magnetically held solenoid to permit the discharge of the power storage device through the magnetically held solenoid to extend the magnetically held solenoid upon removal of the power source,

wherein the power discharge bypass includes a switching device operable between an open and a closed position and a time delay circuit connected to the switching device to close the switching device to allow the power storage device to discharge through the magnetically held solenoid after a time delay following the removal of the power source.

5,815,366

ELECTROSTATIC CHUCK AND THE METHOD OF OPERATING THE SAME

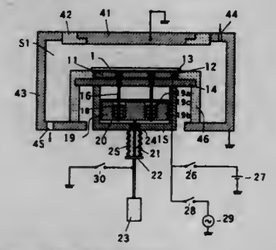
Yoshihisa Morita, Yokohama; Nobuo Okumura, Ikoma, and Toshio Nakanishi, Takarazuka, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Dec. 20, 1995, Ser. No. 575,864

Claims priority, application Japan, Dec. 28, 1994, 6-327150; Jul. 19, 1995, 7-182836

Int. Cl.[6] H02N *13/00*

U.S. Cl. 361—234 **9 Claims**



1. An electrostatic chuck comprising:

a plurality of ejector pins;

means of moving up and down said ejector pins;

means of electrically grounding said ejector pins; and

an ejector buffer mechanism disposed between said ejector pins and said ejector pin moving means for exerting a buffer action moving the tip positions of individual ejector pins independently, relatively, to one another throughout a range of movement for each pin that ensures all of said plurality of pins contact the rear surface of a workpiece held by said chuck.

5,815,367

LAYERED CAPACITORS HAVING AN INTERNAL INDUCTOR ELEMENT

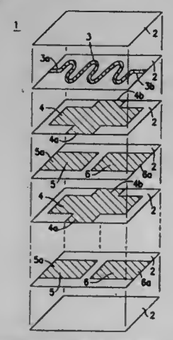
Kyoshin Asakura, Sabae, and Shozo Takeuchi, Fukui, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 10, 1997, Ser. No. 815,279

Claims priority, application Japan, Mar. 11, 1996, 8-083249; Jun. 27, 1996, 8-166994

Int. Cl.[6] H01G *4/005*

U.S. Cl. 361—303 **8 Claims**



1. A multi-terminal, layered capacitor with a plurality of dielectric sheets, said dielectric sheets comprising:

an external input terminal;

an external output terminal;

an external ground terminal;

a first internal capacitor electrode electrically connected to said external input terminal;

a second internal capacitor electrode electrically connected to said external output terminal;

an internal ground electrode electrically connected to said external ground terminal, said internal ground electrode producing a capacitance between said first internal capacitor electrode and said internal ground electrode and a second capacitance between said second internal capacitor electrode and said internal ground electrode; and

an internal inductor electrode electrically connected between said external input terminal and said external output terminal, wherein said plurality of dielectric sheets are stacked integrally.

5,815,368

MONOLITHIC CERAMIC CAPACITOR

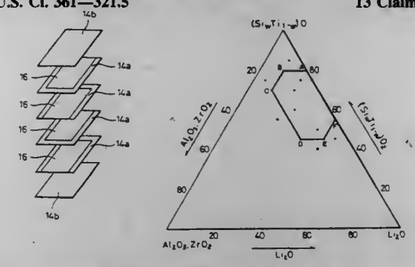
Norihiko Sakamoto, Shiga-ken; Harunobu Sano, Kyoto; Hiroyuki Wada, Shiga-ken, and Yukio Hamaji, Otsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 769,109, Dec. 18, 1996, Pat. No. 5,731,950. This application Sep. 29, 1997, Ser. No. 940,092

Claims priority, application Japan, Dec. 20, 1995, 7-349732

Int. Cl.[6] H01G *4/06*

U.S. Cl. 361—321.5 **13 Claims**



1. A dielectric ceramic composition adapted for use in a monolithic ceramic capacitor, characterized in that the dielectric ceramic comprises a barium titanate having a content of alkali metal oxide impurities of about 0.02% by weight or less, and the compositional formula:

$$(1-\alpha-\beta)\{BaO\}_m.TiO_2+\alpha\{(1-x)M_2O_3+xRe_2O_3\}+\beta(Mn_{1-y-z}Ni_yCo_z)O$$

where Re_2O_3 is one or more selected from Gd_2O_3, Tb_2O_3 and Dy_2O_3;

M_2O_3 is one or more selected from Sc_2O_3 and Y_2O_3 and α, β, m, x, y and z are as follows:

$0.0025 \leqq \alpha \leqq 0.025$

$0.0025 \leqq \beta \leqq 0.05$

$\beta/\alpha \leqq 4$

$0 < x \leqq 0.50$

$0 \leqq y < 1.0$

$0 \leqq z < 1.0$

$0 \leqq y+z < 1.0$

$1.000 < m \leqq 1.035$;

magnesium oxide in an amount of from about 0.5 to 5.0 mols, in terms of MgO relative to 100 mols of the titanate, and

from 0.2 to 3.0 parts by weight, relative to 100 parts by weight of said titanate and magnesium oxide of a Li_2O—$(Si,Ti)O_2$—Al_2O_3—ZrO_2 oxide.

5,815,369

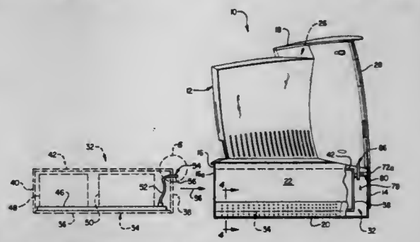
COMPUTER PC TRAY TO MONITOR ASSEMBLY CONNECTION APPARATUS AND ASSOCIATED METHODS

Gilbert L. Quesada, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 4, 1997, Ser. No. 800,650

Int. Cl.[6] G06F *1/16;* **H05K** *7/10;* **H01H** *9/00*

U.S. Cl. 361—686 **19 Claims**



1. Electronic apparatus comprising:

a wall member having first and second sides;

a control member movably carried on said wall member and being manually operable from said first side thereof;

a circuit structure supported adjacent said second side and including a switch structure operatively engageable by said control member in response to movement thereof, and a first connector electrically coupled to said switch structure; and

a support structure adapted to carry an electrical device, said support structure having a second connector carried thereon and being connectable to the electrical device, said support structure being movable toward said second side of said wall member in a manner operatively coupling said first and second connectors.

5,815,370

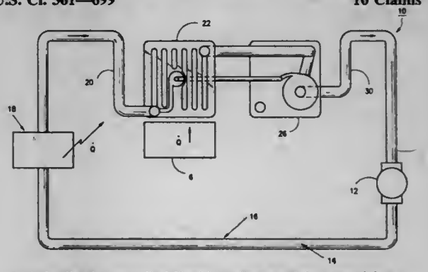
FLUIDIC FEEDBACK-CONTROLLED LIQUID COOLING MODULE

Trevor G. Sutton, 5616 S. Pirates Cove, Tempe, Ariz. 85283

Filed May 16, 1997, Ser. No. 857,260

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—699 **10 Claims**



1. A feedback-controlled liquid cooling module comprising:

a source of pressure for urging a flow of a liquid coolant;

a first cooling plate in fluid communication with said pressure source and conducting heat away from a heat producing component, said first cooling plate defining an inlet, an outlet and a cooling passage for conveying said flow of liquid coolant between said inlet and said outlet;

a thermally sensitive fluidic element in fluid communication with said cooling passage, for providing a fluidic control signal responsive to temperature of said liquid coolant;

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a fluidic amplifier in fluid communication with said first cooling plate, said fluidic amplifier regulating said flow of liquid coolant through said first cooling plate in response to said fluidic control signal.

5,815,371

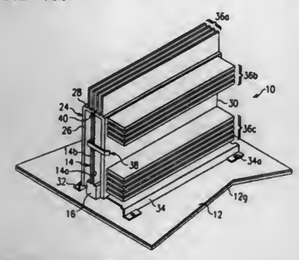
MULTI-FUNCTION HEAT DISSIPATOR

John Jeffries, Marble Falls, and Ray Wang, Austin, both of Tex., assignors to Dell U.S.A., L.P., Round Rock, Tex.

Filed Sep. 26, 1996, Ser. No. 718,972

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—704 **16 Claims**



1. A computer comprising:

a mother board;

a daughter board connected to the mother board through a connector at a first end of the daughter board;

an electrical device connected to a first face of the daughter board, the electrical device generating heat;

a heat dissipator coupled to the electrical device for dissipating the heat, the heat dissipator comprising a first frame plate parallel to the first face of the daughter board, adjacent the electrical device, a second frame plate parallel to a second face of the daughter board, opposite the first face, and a third frame plate transverse to and interconnected with the first and second frame plates;

a first daughter board support including a notch formed in the third frame plate for receiving a second end of the daughter board opposite the first end, and for limiting the daughter board from movement away from the connector; and

a second daughter board support including a clip connected between the first and second ends of the daughter board and further connected to at least one of the frame plates parallel to the daughter board for limiting the daughter board from vibrating.

5,815,372

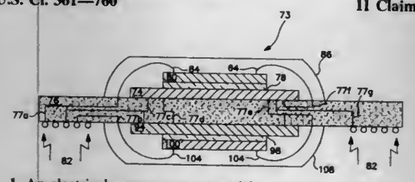
PACKAGING MULTIPLE DIES ON A BALL GRID ARRAY SUBSTRATE

William N. Gallas, Queen Creek, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 25, 1997, Ser. No. 822,743

Int. Cl.[6] H01L *25/00*

U.S. Cl. 361—760 **11 Claims**



1. An electrical arrangement comprising:

a circuitized substrate having (i) a first substrate surface including a set of substrate contacts disposed thereon, and (ii) a second substrate surface including a set of input/output contacts disposed thereon; and,

a first die having (i) a first die surface including a set of first die contacts disposed thereon which is coupled to a first portion of said set of substrate contacts, and (ii) a second die surface configured to receive a second die having a third die surface and a set of second die contacts disposed on said third die surface;

wherein a second portion of said set of substrate contacts configured is to be coupled to said set of second die contacts disposed on said second die through the use of a set of electronically conductive wires, and said circuitized substrate electrically interconnects said first portion and second portion of said set of substrate contacts and said set of input/output contacts to form a predetermined circuit.

5,815,373

COUPLING DEVICE PRESENTING AND/OR DOMINATING A CAPACITANCE BELONGING TO A BOARD WITH A PRINTED CIRCUIT

Helge Bodahl Johnsen, Huddinge, and Mats Olav Timgren, Saltsjö-Boo, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

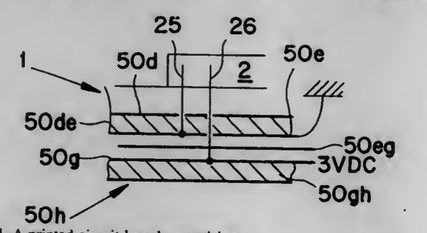
PCT No. PCT/SE95/00892, § 371 Date Feb. 7, 1997, § 102(e) Date Feb. 7, 1997, PCT Pub. No. WO96/06389, PCT Pub. Date Feb. 29, 1996

PCT Filed Jul. 31, 1995, Ser. No. 776,765

Claims priority, application Sweden, Aug. 22, 1994, 9402792/7

Int. Cl.[6] H05K *1/03;1/11;1/14;1/16*

U.S. Cl. 361—763 **4 Claims**



1. A printed circuit board comprising:

a plurality of electrically conducting layers where at least one of said electrically conducting layers is a reference potential layer and at least one other of said electrically conducting layers is a supply voltage layer;

an electrically isolating layer positioned between adjacent reference potential and supply voltage layers;

a plurality of circuits and/or components mounted on said printed circuit board, wherein at least one of said plurality of circuits and/or components is supplied with a voltage through a plurality of connecting conductors which are connected to said reference potential and supply voltage layers; and

a DC/DC-converting circuit mounted on said printed circuit board and comprising a plurality of adapted smoothing capacitors;

wherein

said electrically isolating layer is composed of a plastic-coated, glass-fiber fabric with a thickness in a range of 0.01 to 0.06 mm;

said plurality of connecting conductors are less than 1.5 mm in length;

a rise time and/or fall time of an instantaneous current created as a result of said plurality of circuits and/or components being activated/deactivated is within a range of nano-seconds to pico-seconds; and

a surface extension of adjacent reference potential and supply voltage layers and the thickness of said associated electrically isolating layer are adapted to form a capacitor function to smooth voltage spikes so that the supply voltage can be constant around said plurality of circuits and/or components even at rapid variations in the activation and deactivation of said plurality of circuits and/or components.

5,815,374

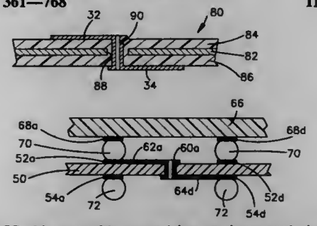
METHOD AND APPARATUS FOR REDIRECTING CERTAIN INPUT/OUTPUT CONNECTIONS OF INTEGRATED CIRCUIT CHIP CONFIGURATIONS

Wayne John Howell, Williston, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1996, Ser. No. 722,717

Int. Cl.[6] H05K *7/02*

U.S. Cl. 361—768 **11 Claims**



1. An IC chip assembly comprising, an integrated circuit chip having an array of connectors thereon in a given pattern, at least some of which connectors are in an unwanted configuration,

an interposer, said interposer having a metal sheet with an organic dielectric material disposed on both sides thereon and having a chip connection surface and an output surface,

a first set of connection pads on said chip connection surface arranged in said given pattern,

a second set of connection pads on said output surface arranged in said given pattern,

conducting vias extending from said chip connection surface to said output surface,

the connectors on said IC chip being directly connected to said first set of connection pads,

conducting circuitry on said surfaces of said interposer to convert said unwanted configuration of said connection pads on said IC chip to a wanted configuration of said second set of connection pads.

5,815,375

Patent Not Issued For This Number

5,815,376

Patent Not Issued For This Number

5,815,377

APPARATUS FOR AUTO DOCKING PCI CARDS

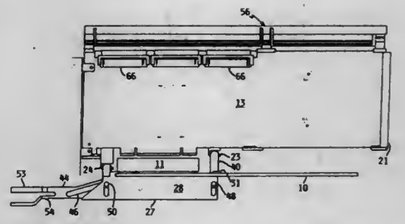
David George Lund, Byron; James Larry Peacock, Rochester, and Scott Alan Shurson, Kasson, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1997, Ser. No. 986,771

Int. Cl.[6] H01R *13/629;4/50*

U.S. Cl. 361—802 **15 Claims**

1. In an electrical apparatus wherein a mother board is supported within an enclosure and has a card socket for receiving a circuit card connector, mounted on one surface thereof, a circuit card docking apparatus for installing a circuit card in said card socket from the exterior of said enclosure comprising



a circuit card holder;

a circuit card mounted on said circuit card holder and presenting a connector at one edge thereof;

card guide means mounted within said enclosure for slidably supporting and guiding said card holder into said enclosure to a position whereat said circuit card connector is aligned with said card socket;

camming means supported on said mother board at the surface opposite said one surface and aligned with said socket;

means for connecting said camming means to said card holder when said circuit card mounted on said card holder is aligned with said socket; and

said camming means includes a cam mechanism operable from exterior of said enclosure to move said card holder toward said mother board and insert said connector into said socket.

5,815,378

FLYBACK TRANSFORMER

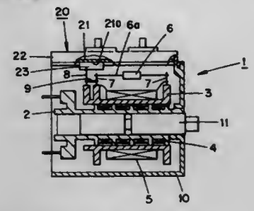
Tadao Nagai, Shiga-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Feb. 27, 1996, Ser. No. 606,739

Claims priority, application Japan, Feb. 28, 1995, 7-039733

Int. Cl.[6] H02B *1/04*

U.S. Cl. 361—836 **10 Claims**



1. A flyback transformer comprising:

a primary winding;

a high voltage bobbin provided with a plurality of electronic-component mounting terminals and adjacent to said primary winding;

a high-voltage secondary winding, which is divided into a plurality of portions, wound on said high-voltage bobbin, said divided portions of said high-voltage secondary winding being connected to each other through electronic components mounted to said electronic-component mounting terminals;

an additional connection terminal provided on said electronic-component mounting terminals; and

connection means for selectively connecting one of said electronic-component mounting terminals to said additional connection terminal.

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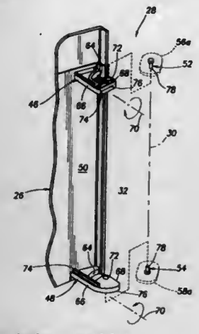
5,815,379
PIVOTABLE COMPUTER ACCESS DOOR STRUCTURE HAVING CONCEALED, BREAK-AWAY HINGE MECHANISM

Kevin W. Mundt, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 9, 1997, Ser. No. 871,124
Int. Cl.[6] G06F *1/16;* **H05K** *5/02*
U.S. Cl. 361—683 **40 Claims**

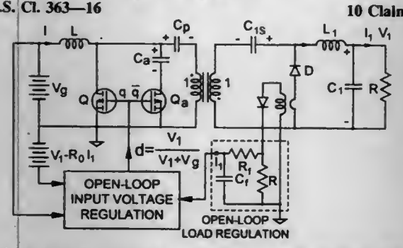


1. An electronic device comprising:
a housing having a wall opening therein;
an access door; and
first and second pivotally interengaged hinge portions respectively carried by said access door and said housing, said first and second hinge portions:
(1) supporting said access door for pivotal movement relative to said housing, about a pivot axis, between a closed position and an open limit position in which said access door respectively covers and uncovers said wall opening, and
(2) permitting said access door to be replaceable detached from said housing, in response to forcibly pivoting said access door outwardly beyond said open limit position, by creating between said first and second hinge portions a resilient camming interaction which disengages them in a manner leaving said second hinge portion in place on said housing.

5,815,380
SWITCHING CONVERTER WITH OPEN-LOOP PRIMARY SIDE REGULATION

Slobodan Cuk, Laguna Hills, and Zhe Zhang, Rancho Santa Margarita, both of Calif., assignors to Optimum Power Conversion, Inc., Irvine, Calif.

Filed Nov. 16, 1993, Ser. No. 153,667
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—16 **10 Claims**

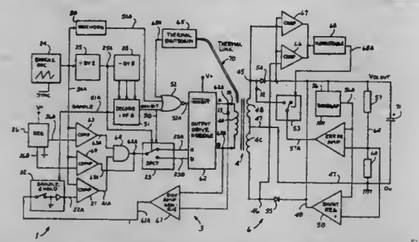


1. A dc-to-dc switching converter having an isolation transformer and means on the primary side of said isolation transformer for regulating against any changes in the input voltage from a dc voltage source and against load current changes comprising:
a power processing stage having: a dc voltage source in series with an input inductor and a first energy transferring capacitor in series with the primary winding of said isolation transformer in that sequence, and a main current bidirectional switch connecting a junction of said input inductor and said first energy transfer capacitor to the return current path of said primary winding to said dc voltage source, and an auxiliary current bidirectional switch and auxiliary capacitor in a series circuit connected in parallel with said main current bidirectional switch; a second energy transferring capacitor, output inductor and load connected in series between the secondary winding of said isolation transformer and the return current path from said load to said secondary winding, a filter capacitor in parallel with said load, and a diode rectifier connecting the junction between said second energy transferring capacitor and said output inductor to said return current path from said load;
a reference voltage source for setting desired input voltage level for operation of said dc-to-dc converter;
control means for alternately switching said main and auxiliary current bidirectional switches on and off out of phase at a fixed frequency and regulated duty ratio such that while either one is on the other is off, means isolated from said secondary side for sensing load current and means responsive to said sensing means for varying said reference voltage as a function of load current;
open-loop regulation means for comparing said input voltage to said reference voltage after it has been varied; and
means for varying said duty ratio as a function of the ratio of the varied reference voltage and the sum of said reference voltage and said input voltage from said dc voltage source, to achieve open-loop input voltage regulation against any changes in the input voltage and load current changes.

5,815,381
SINGLE-BARRIER CLOSED LOOP DC-TO-DC CONVERTER AND METHOD

Trevor M. Newlin, Livingston, Scotland, assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Jun. 6, 1997, Ser. No. 870,211
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—17 **22 Claims**

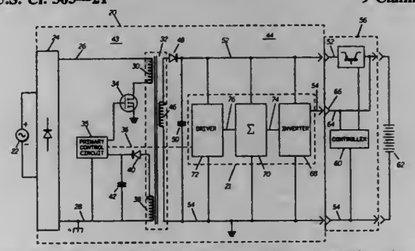


1. In a method of converting a DC source signal to a regulated DC output voltage by generating a first digital signal and applying power pulses across the primary winding of an isolation transformer in response to the first digital signal to produce the DC output voltage and rectifying corresponding power pulses produced across a secondary winding of the isolation transformer, the improvement comprising the steps of:
(a) cyclically dividing the first digital signal into a first number of equal time frames, at least one of the power pulses occurring during each of the time frames, and during each cycle generating a second digital signal during a first one of the first number of time frames, respectively;
(b) inhibiting the power pulses during the first one of the first number of time frames;
(c) producing an error signal representing an error in the DC output voltage;
(d) detecting the absence of corresponding power pulses from the secondary winding to thereby determine the time of occurrence of the first one of the first number of time frames and then transmitting the error signal to the secondary winding to produce a corresponding error signal across the primary winding; and
(e) modulating the widths of the power pulses in response to the corresponding error signal during the following cycle to adjust the DC output voltage to reduce the error signal.

5,815,382
TRACKING CIRCUIT FOR POWER SUPPLY OUTPUT CONTROL

Roland S. Saint-Pierre, Alpharetta; Dipti V. Vashi, Lawrenceville, both of Ga., and Jose' M. Fernandez, Sunrise, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1996, Ser. No. 643,681
Int. Cl.[6] G02M *3/335*
U.S. Cl. 363—21 **9 Claims**

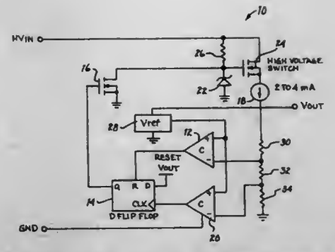


1. A tracking circuit for a power supply, said tracking circuit responsive to a feedback voltage level V_{fb} at a feedback terminal, said power supply having a primary control circuit and providing an output voltage level V_o on an output line, and having a return line, said tracking circuit comprising:
an inverter having an inverter output voltage level V_{io}, said inverter for inverting said feedback voltage level about an inverter reference voltage level V_{ir} and applying a gain factor β, where β is greater than 1, said inverter output voltage level being equal to the lower of either V_o or the value of the formula $(V_{ir}-V_{fb})\beta+V_{ir}$, and not less than zero volts;
a summing network, connected to said inverter, for combining V_o and V_{io} according to preselected proportions to provide a summing voltage V_s at a summing node; and
a driver circuit, connected to said summing network, for signaling said primary control circuit such that said summing voltage is held equal to a preselected driver reference voltage level.

5,815,383
HIGH VOLTAGE START-UP CIRCUIT AND METHOD THEREFOR

Jimes Lei, San Jose, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 490,593, Jun. 15, 1995. This application Dec. 27, 1996, Ser. No. 774,958
Int. Cl.[6] H02M *7/517*
U.S. Cl. 363—49 **15 Claims**

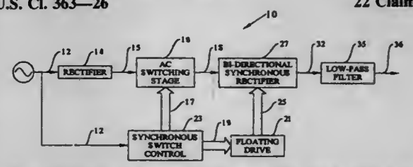


15. A high voltage start-up circuit for a switchmode power supply comprising, in combination:
high voltage input line for supplying power to said start-up circuit;
switching means coupled to said high voltage input line for turning off said high voltage input line by sensing a decrease in an output voltage of said start-up circuit;
trip point setting means coupled to said switching means for resetting and turning on said high voltage input line; and
current limiting means coupled to said high voltage input line for limiting current flow from said high voltage input line to an output of said start-up circuit.

5,815,384
TRANSFORMER WHICH USES BI-DIRECTIONAL SYNCHRONOUS RECTIFICATION TO TRANSFORM THE VOLTAGE OF AN INPUT SIGNAL INTO AN OUTPUT SIGNAL HAVING A DIFFERENT VOLTAGE AND METHOD FOR EFFECTUATING SAME

Russell E. Hammond, La Jolla, and Leopold J. Johnson, Valley Center, both of Calif., assignors to The United States of American as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1997, Ser. No. 855,689
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—26 **22 Claims**



9. A transformer for transforming a voltage signal from a first voltage level to a second voltage level, comprising:
a rectifier for transforming a first time varying voltage signal into a full-wave rectified voltage signal;
a synchronous switch control for generating first and second control signals in response to sampling said first voltage signal;
a floating drive buffer which generates third control signals in response to receiving said second control signals;
an AC switching stage where in response to receiving said first control signals, transforms said full-wave rectified voltage signal into a first series of voltage pulses having amplitudes defined by a first time varying function and a second series of voltage pulses having amplitudes defined by a second time varying function, where said second time varying function is approximately 180 degrees out of phase with respect to said first time varying function;
a bi-directional synchronous rectifier for transforming said first and second series of voltage pulses into a third series of voltage pulses in response to receiving said third control signals, where said third series of voltage pulses has amplitudes defined by a third time varying function having alternate positive and negative half-cycles, where said positive half-cycles include positive voltage pulses and said negative half-cycles include negative voltage pulses; and
a filter for transforming said third series of said third voltage pulses into a second time varying voltage signal.

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5,815,385

CONTROL OF AN INSTALLATION FOR TRANSMISSION OF HIGH-VOLTAGE DIRECT CURRENT

Mats Hyttinen, and Henrik Spjut, both of Ludvika, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

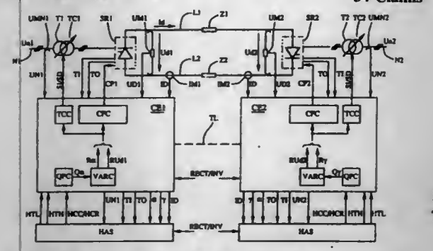
PCT No. PCT/SE95/00587, § 371 Date Oct. 9, 1996, § 102(e) Date Oct. 9, 1996, PCT Pub. No. WO95/32537, PCT Pub. Date Nov. 30, 1995

PCT Filed May 24, 1995, Ser. No. 732,382

Claims priority, application Sweden, May 24, 1994, 9401774

Int. Cl.[6] H02J *3/00;* **H02H** *7/00;* **H02M** *3/24*

U.S. Cl. 363—34 **34 Claims**



1. A device for control of an installation for transmission of high-voltage direct current in dependence on at least one stress parameter for a valve in a converter included in the installation and controlled by a piece of control equipment (CE1, CE2), which stress parameter is any of power losses (PdR, PdI) in a damping circuit (RD, CD), a voltage stress (UAmax) on a surge arrester (A), the temperature (Tr) in a damping circuit (LD), and the temperature (Tt) in a semiconductor element (T1, T2, . . . Tn), wherein the control equipment comprises a tap-changer control unit (TCC), wherein the device (HAS) comprises a monitoring device (PD, UA, TR, TT) for continuously calculating, based on predetermined relationships (f1, f2, g1R, g2R, g1I, g2I, h1, h2) and in dependence on supplied values (UN, α, γ, ID, TO, TI, RECT/INV) of the operating parameters of the installation, a value (PDR, PDI, UMAX, TRC, TTC) of the stress parameter and for comparing the calculated value with at least one comparison value, and that the device in dependence on the comparison generates at least one influencing signal (HTH, HCC, HCR), which influencing signal (HTH) is supplied to said tap-changer control unit to step the tap-changer in a direction towards a decreasing ideal no-load direct voltage (Udi0).

5,815,386

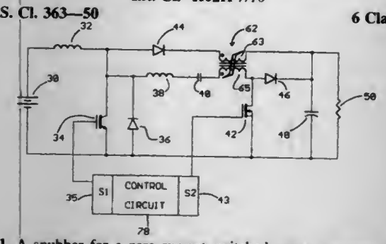
SNUBBER FOR ZERO CURRENT SWITCHED NETWORKS

Jay M. Gordon, Keyport, N.J., assignor to Factor One, Inc., Keyport, N.J.

Filed Jun. 19, 1997, Ser. No. 878,928

Int. Cl.[6] H02H *7/10*

U.S. Cl. 363—50 **6 Claims**



1. A snubber for a zero-current switched power converter, the converter including a main switch, an auxiliary controllable switch, a resonant network between said main switch and said auxiliary controllable switch to effect zero-current switching and a switching diode across the resonant network, wherein the snubber comprises a coupled saturable inductor having a snubber winding and a reset winding;

the snubber winding of said coupled saturable inductor being connected in series with the switching diode;

the reset winding of said coupled saturable inductor being connected in series with the resonant network of said converter; and

wherein said snubber and reset windings are connected such that current through said resonant network and said reset winding prior to the turnoff of the main controllable switch causes said coupled saturable inductor to saturate, and subsequent current flow through said switching diode is unopposed by said snubber winding.

5,815,387

TRANSFORMER PROTECTIVE APPARATUS HAVING SEMICONDUCTOR AND MECHANICAL BYPASS MEANS

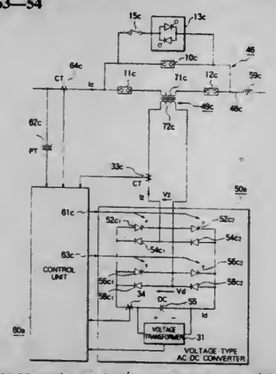
Tomohiko Aritsuka, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1996, Ser. No. 661,474

Claims priority, application Japan, Dec. 13, 1995, 7-324858

Int. Cl.[6] H02H *7/125;7/045*

U.S. Cl. 363—54 **6 Claims**



1. A power converter protective apparatus comprising:

a transformer having a primary winding connected in series with a power system and a secondary winding connected to a power converter;

fault detector means for detecting a fault in the power system and generating a fault signal upon detecting a fault in the power system;

control means for outputting a bypass control signal when the fault detector means generates a fault signal; and

normally open current bypass means connected in parallel with the primary winding and responsive to the bypass control signal so that a fault current flowing through the primary winding is bypassed by the current bypass means in response to detection of a fault in the power system, the current bypass means comprising a parallel connection of a high-voltage bypass semiconductor circuit breaker and a high-voltage bypass mechanical circuit breaker, the high-voltage bypass semiconductor circuit breaker being closed for a fixed time upon detection of a fault and thereafter opening, the high-voltage bypass mechanical circuit breaker being closed upon detection of a fault and remaining closed until the fault is removed.

5,815,388

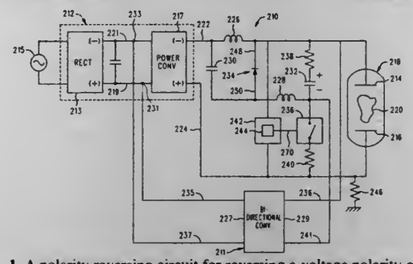
POLARITY REVERSING CIRCUIT HAVING ENERGY COMPENSATION

Barry W. Manley, Boulder, Colo.; Keith H. Billings, Guelph, Canada, and Lance J. Collins, Superior, Colo., assignors to Sierra Applied Sciences, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 667,417, Jun. 21, 1996, Pat. No. 5,682,067. This application Jul. 22, 1997, Ser. No. 898,481

Int. Cl.[6] H02M *7/02;* **C23C** *14/34*

U.S. Cl. 363—63 **28 Claims**



1. A polarity reversing circuit for reversing a voltage polarity on a first electrode and a second electrode, comprising:

a first inductor;

means for connecting said first inductor between the first electrode and a negative terminal of an external power supply;

means for connecting the second electrode to a positive terminal of the external power supply;

a diode having a cathode and an anode;

means for connecting the cathode of said diode to the first electrode;

a first capacitor;

means for connecting said first capacitor between the anode of said diode and the negative terminal of the external power supply;

a second inductor having a first lead and a second lead;

means for connecting the first lead of said second inductor to the anode of said diode;

a second capacitor;

means for connecting said second capacitor between the second lead of said second inductor and the first electrode;

switching means connected between the second lead of said second inductor and the positive terminal of the external power supply for selectively connecting the second lead of said second inductor to the positive terminal of the external power supply in response to a switch actuation signal; and

bi-directional converter means connected across said second capacitor and connected to the external power supply for transferring electrical energy between said polarity reversing circuit and the external power supply.

5,815,389

SYSTEM LEVEL CURRENT LIMITING

Robert J. Plow, Avon Lake; Thomas G. Lock, Elyria; James A. Giancaterino, Sheffield Lake, and John E. Mitchell, Vermillon, all of Ohio, assignors to Reltec Corporation, Lorain, Ohio

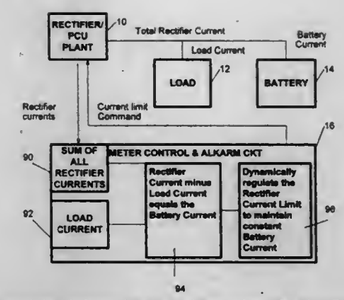
Filed Oct. 3, 1996, Ser. No. 726,318

Int. Cl.[6] H02M *7/00;* **H02J** *7/04*

U.S. Cl. 363—67 **17 Claims**

1. A method of generating a system level current limit in a power distribution system supplying a load, the power distribution system having a controller in operative connection with a plurality of intelligent power conversion units (PCUs) and, a re-chargeable back-up battery re-chargeable by the PCUs, the method comprising the steps of:

determining a number of active PCUs and their operational ratings;



transmitting information as to the number of active PCUs and their operational ratings to the controller;

determining a load current value;

determining a battery re-charge current value;

summing the load current value and the battery re-charge current value to obtain a system level current limit value;

storing the system level current limit value in the controller;

apportioning the system level current limit value in accordance with the number of active PCUs and their operational ratings, to obtain PCU current limit values for the active PCUs;

transmitting the obtained PCU current limit values to the active PCUs; and,

adjusting the current limit of each of the active PCUs according to the obtained PCU current limit values.

5,815,390

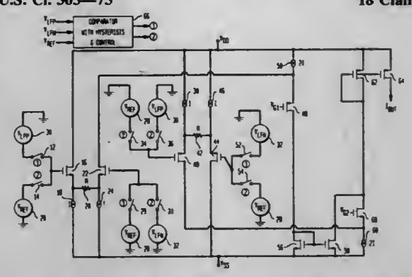
VOLTAGE-TO-CURRENT CONVERTER

Kadaba R. Lakshmikumar, Somerset County, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 1, 1996, Ser. No. 724,630

Int. Cl.[6] G05F *3/16;* **H02M** *7/00*

U.S. Cl. 363—73 **18 Claims**



1. A voltage-to-current converter for converting a differential voltage signal having a first and second voltage signal components, to an output current signal, comprising:

a first differential voltage-to-current converter configured to receive one of said first and second voltage signal components and a reference voltage signal, to provide a first substantially linear output current signal;

a second differential voltage-to-current converter configured to receive the other one of said first and second voltage signal components and said reference voltage signal, to provide a second substantially linear output current signal; and

an adder configured to receive said first and second output current signals and to provide said output current signal.

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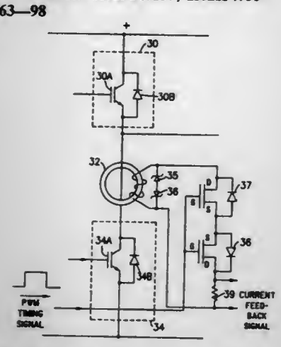
5,815,391

CURRENT SENSING CIRCUIT FOR PULSE WIDTH MODULATED MOTOR DRIVE

Brian R. Pelly, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Filed Mar. 19, 1997, Ser. No. 820,574
Int. Cl.[6] H02M *5/257;* **H02H** *7/00*
U.S. Cl. 363—98 **17 Claims**



1. A circuit for sensing the current of an inverter-switch, the inverter-switch having an input terminal connected to a respective one of a supply terminal and a common terminal and having an output terminal, the inverter-switch being responsive to a control signal, said circuit comprising:

a current transformer having a primary winding coupled to one of the input and output terminals of said inverter-switch, and having a secondary winding for generating an output signal that is proportional to the current in the inverter-switch;

a resistor coupled to a terminal of said secondary winding of said transformer; and

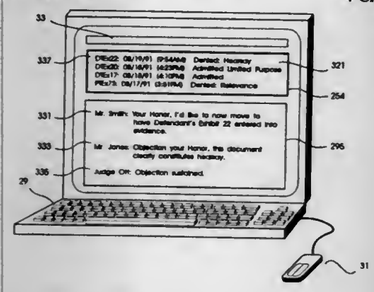
an a-c switch coupled in series between another terminal of said secondary winding and said resistor and being responsive to said control signal for disconnecting said resistor when said inverter-switch is in an off state.

5,815,392

ATTORNEY TERMINAL HAVING OUTLINE PREPARATION CAPABILITIES FOR MANAGING TRIAL PROCEEDINGS

James D. Bennett, Chicago, and Lawrence M. Jarvis, Wheaton, both of Ill., assignors to Engate Incorporated, Wheaton, Ill.

Continuation of Ser. No. 326,742, Oct. 20, 1994, Pat. No. 5,444,615, which is a continuation of Ser. No. 73,809, Jun. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 36,488, Mar. 24, 1993, Pat. No. 5,369,704. This application Aug. 22, 1995, Ser. No. 518,102
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—401 **4 Claims**



1. A transcription system used to convert words spoken during a legal proceeding to a textual form for real time display comprising:

transcription means for producing, in real time, transcript signals representative of spoken words;

filter means for performing a real time analysis of transcript signals produced by said transcription means to identify attempts to enter items into evidence;

storage means responsive to said filter means for storing the transcript signals associated with such attempts; and

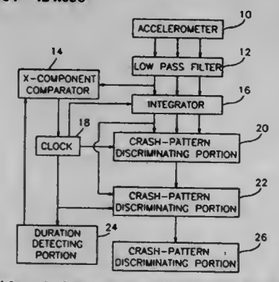
viewing means interactive with said storage means for displaying for review the transcript signals associated with such attempts stored in the storage means.

5,815,393

AIRBAG DEPLOYMENT CONTROL APPARATUS FOR VEHICLE AND THE METHOD

Kyeong-Seon Chae, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 31, 1995, Ser. No. 550,791
Claims priority, application Rep. of Korea, Oct. 31, 1994, 1994-28168
Int. Cl.[6] B60R *21/32*
U.S. Cl. 364—424.056 **18 Claims**



1. An airbag deployment control apparatus for an automotive vehicle, comprising:

3-direction deceleration sensing means for sensing vehicle deceleration due to crash and generating 3-direction deceleration signals;

low-pass filter means for removing high-frequency components of said 3-direction deceleration signals outputted from said 3-direction deceleration sensing means;

integrator means for integrating outputs from said low-pass filter means;

first-direction component comparing means for comparing a first-direction component of said outputs from said low-pass filter means with a threshold for first direction;

crash-pattern discriminating means responsive to said integrator means for discriminating crash patterns based upon outputs from said integrator means and generating a crash-pattern information value;

airbag-deployment determining means responsive to said crash-pattern discriminating means for comparing the output from said integrator means with a threshold for crash pattern corresponding to said crash-pattern information value and determining whether an airbag is to be deployed;

clock signal generating means for generating clock signals in order to provide a standard time, said clock signal generation means being reset in response to a reset signal outputted from said first-direction component comparing means when said first-direction component exceeds said threshold for first direction;

duration detecting means being reset responsive to said clock signal generating means for detecting a duration period wherein said first-direction component exceeds said threshold for first direction and providing a reset signal to said first-direction component comparing means to reset said first-direction component comparing means when said duration period does not exceed a predetermined period; and

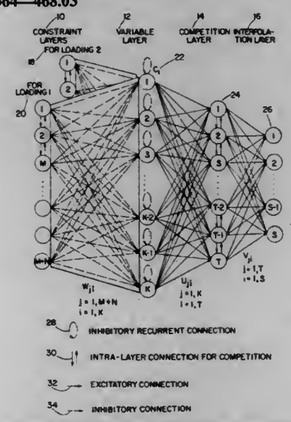
airbag deploying means for generating an electric signal for deploying said airbag in response to an airbag deploying signal from said airbag-deployment determining means.

5,815,394

METHOD AND APPARATUS FOR EFFICIENT DESIGN AUTOMATION AND OPTIMIZATION, AND STRUCTURE PRODUCED THEREBY

Hojjat Adeli, Powell, Ohio, and Hyo Seon Park, Kyungki-do, Rep. of Korea, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Apr. 4, 1996, Ser. No. 628,588
Int. Cl.[6] G06F *19/00;* **G06G** *7/6466*
U.S. Cl. 364—468.03 **9 Claims**



2. A computer for optimizing the engineering design for an engineering structure comprising structural members, said computer comprising:

a microprocessor being encoded with programming instructions, said instructions adapted to:

(a) define a plurality of general non-linear constraints of said engineering structure;

(b) determine a design parameter of said structural members of said engineering structure; and

(c) optimize said design parameter in response to said plurality of general non-linear constraints through application of a learning rule through the integration of a Kuhn-Tucker necessary condition for at least one local minimum of a Lyapunov energy functional involving an exterior penalty function method and through application of a pseudo-objective function in the form of said Lyapunov energy functional.

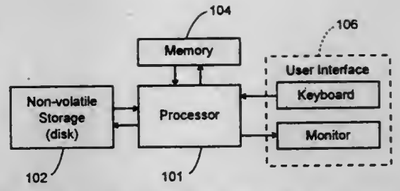
5,815,395

DIAGNOSTIC METHOD AND APPARATUS FOR CONFIGURATION ERRORS

Drew R. Hart; Richard C. McCray, both of Columbus, and Kenneth W. Kreager, Mt. Sterling, all of Ohio, assignors to Interface Definition Systems, Inc., Columbus, Ohio

Filed Jun. 29, 1995, Ser. No. 496,334
Int. Cl.[6] G05B *19/18*
U.S. Cl. 364—468.17 **13 Claims**

1. A method for product configuration management in controlling the manufacture of a product structure formed by assembled, multiple component configuration items represented by data arranged in a hierarchical, bill of material stored in a computer



information processing system having a processor, a memory, a nonvolatile storage device and user interface apparatus, the method comprising the steps in the computer information processing system:

(a) storing a hierarchical bill of material component data file defining and representing occurrences of and the arrangement of the assembled component configuration items of a product structure with a plurality of levels, each occurrence of each configuration item having a stored level code representing the assembled relationship of the item to other items in the assembled product structure, the occurrences and associated level codes being arranged in increasing detail and numerically higher code in proceeding from the most generic parent occurrence of a configuration item at the highest level in the product structure to the most detailed lowest level occurrence of a configuration item in the product structure;

(b) storing in memory an occurrence of a failed configuration item included in said component data file;

(c) retrieving and storing in memory the level code of the occurrence of the failed configuration item;

(d) storing in memory an occurrence of an effecting configuration item included in said component data file;

(e) retrieving and storing in memory the level code of the stored occurrence of the effecting configuration item;

(f) differencing the level code of the occurrence of the failed configuration item and the level code of the occurrence of the effecting configuration item;

(g) storing, as an initial error value, the level code difference from the preceding step;

(h) storing a selected initial error value confidence limit in association with said initial error value;

(i) comparing said initial error value confidence limit to its associated error value; and

(j) signalling an alarm condition if said error value exceeds said associated confidence limit.

5,815,396

VACUUM PROCESSING DEVICE AND FILM FORMING DEVICE AND METHOD USING SAME

Hideaki Shimamura; Yuji Yoneoka, both of Yokohama; Shigeru Kobayashi, Hiratsuka; Satosi Kisimoto, Yokohama; Sunao Matsubara, Tokorozawa; Hiroyuki Shida, Koganei; Yukio Tanigaki, Tachikawa; Masashi Yamamoto, Yamanashi-ken; Susumu Tsuzuku, Tokyo-to; Eisuke Nishitani, Yokohama; Tokio Kato, Tokyo-to, and Akira Okamoto, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 18,390, Feb. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 741,526, Aug. 12, 1991, abandoned. This application May 9, 1995, Ser. No. 437,683
Claims priority, application Japan, Feb. 17, 1992, 4-029185; Jun. 19, 1992, 4-161188; Nov. 24, 1992, 4-313079
Int. Cl.[6] G06F *11/00;19/00*
U.S. Cl. 364—469.02 **48 Claims**

1. A processing device for processing of a substrate comprising:

at least one infrared radiation thermometer for measuring a substrate temperature for processing of the substrate;

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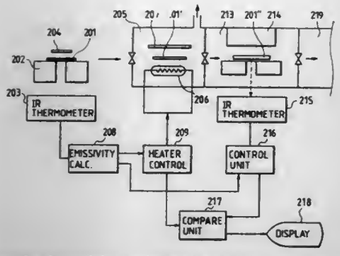


means for determining an infrared emissivity of the substrate in accordance with an infrared emissivity at a temperature of at least 500° C.;

means for determining a calibration of the infrared radiation temperature with respect to the substrate;

means for beating the substrate; and

means for determining heating conditions of the heating means on the basis of the determined infrared emissivity of the substrate.

5,815,397

METHOD OF ANALYZING FACTORS AFFECTING PRODUCT QUALITY AND ADJUSTING MOLDING CONDITIONS FOR INJECTION MOLDING MACHINE

Osamu Saito, Oshino-mura; Hiroshi Watanabe, Fujiyoshida, and Kenji Araki, Oshino-mura, all of Japan, assignors to Fanuc Ltd., Yamanishi, Japan

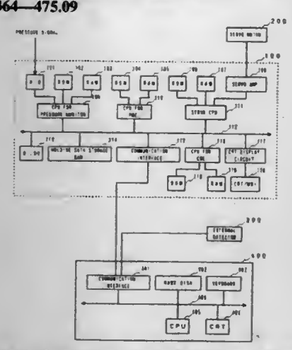
PCT No. PCT/JP95/02182, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO96/13370, PCT Pub. Date May 9, 1996

PCT Filed Oct. 24, 1995, Ser. No. 666,370

Claims priority, application Japan, Oct. 27, 1994, 6-286148

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—475.09 **11 Claims**



1. A method of analyzing factors affecting product quality of an injection molding machine, comprising the steps of:

(a) detecting data of plural conditions relating to an injection molding operation for each predetermined molding cycle and storing the detected data as plural series of data for respective conditions:

(b) executing a multivariate analysis to divide said plural conditions into groups of correlated conditions based on the respective series of data stored in said step (a);

(c) grouping the conditions analogous in variation characteristic of the series of data; and

(d) analyzing factors affecting the quality of products molded by the injection molding machine based on the conditions grouped in said step (c).

5,815,398

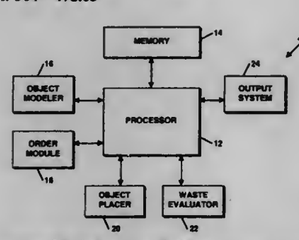
METHOD AND APPARATUS FOR PLACING PARTS IN A BOUNDED REGION

Rahul P. Dighe, Natick, and Mark J. Jakiela, Cambridge, both of Mass., assignors to Massachusettes Institute of Technology, Cambridge, Mass.

Filed Jan. 16, 1996, Ser. No. 586,377

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—478.05 **44 Claims**



1. A process for placing a part in a predetermined region wherein the part is defined by a corresponding part boundary and the predetermined region is defined by a region boundary, the process comprising the steps of:

(a) placing the part in a first location of the predetermined region;

(b) identifying area elements which extend from the part boundary of the part;

(c) computing the area of each of the area elements;

(d) assigning a weight value to each of the area elements, wherein each weight value is a function of a distance from a point on the part to a predetermined location of the area element;

(e) computing a first weighted sum of the area elements surrounding the part boundary in the first location of the predetermined region;

(f) placing the part in a second different location of the predetermined region;

(g) identifying area elements which extend from the part boundary of the part;

(h) computing the area of each of the area elements;

(i) assigning a weight value to each of the area elements, wherein each weight value is a function of a distance from a point on the part to a predetermined location of the area element;

(j) computing a second weighted sum of the area elements surrounding the part boundary in the second different location of the predetermined region;

(k) comparing the first weighted sum to the second weighted sum; and

(l) placing the part in a first one of the first and second locations of the predetermined boundary having the lowest weighted sum.

5,815,399

MULTI-PATH SYNCHRONIZATION SYSTEM FOR CNC CONTROLLER

Kentaro Fujibayashi, Musashino, and Yorikazu Fukui, Tokyo, both of Japan, assignors to Fanuc Ltd, Yamanashi, Japan

Filed Oct. 30, 1995, Ser. No. 549,934

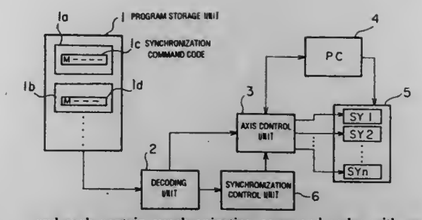
Claims priority, application Japan, Dec. 7, 1994, 6-303368

Int. Cl.[6] G05B *19/4155*

U.S. Cl. 364—474.11 **2 Claims**

1. A multi-path synchronization system for a computerized numerical controller (CNC) in which a single control unit simultaneously controls a plurality of paths, comprising:

program storage means for storing NC programs corresponding to the respective paths, wherein the NC programs each describe a motion of a respective one of the plurality of paths



and each contain synchronization command codes with condition data for the multi-path synchronization;

decoding means for decoding the NC programs;

axis control means for controlling axes in the paths by simultaneously executing the NC programs decoded by said decoding means; and

synchronization control means for synchronizing the axes in the paths according to the condition data accompanying the synchronization command codes, wherein timing of the synchronizing is based upon one of a remaining distance to go and time elapsed.

5,815,400

MACHINING METHOD USING NUMERICAL CONTROL APPARATUS

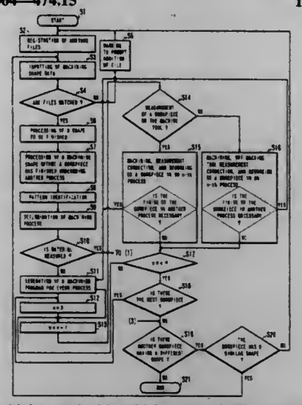
Hayao Hirai, and Akihiko Fujimoto, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 679,158

Claims priority, application Japan, Jul. 10, 1995, 7-197308

Int. Cl.[6] G06F *19/00;* **G06G** *7/64;7/66*

U.S. Cl. 364—474.15 **19 Claims**



1. A machining method in which a numerically controlled apparatus carries out a series of operations for performing a current machining process, the series of operations including at least two of determining machining procedures, selecting a tool, preparing a workpiece, inspecting programs, performing a machining operation, and performing inspection required when a numerically controlled machine tool carries out a machining operation based on input graphics and process information, using at least a plurality of machine tool information, tool information, cutting condition information, material information, machining method symbol information, finishing symbol information, finishing allowance information, surface treatment information, information about thermal refining, and cost information, while using an electronic computer, including at least one of a numerical control unit, an FA system, and a personal computer, and a series of data processing units and machine tools, said method comprising the steps of:

registering a variety of information files;

inputting machining pattern data;

determining whether or not there are dimensional tolerance data, and if there are dimensional tolerance data, calculating a final shape and dimension of the workpiece based on said dimensional tolerance data;

judging whether or not a surface treatment is specified, and if the surface treatment is specified, calculating a form and size of the workpiece prior to being subjected to the surface treatment;

processing a finished pattern based on said machining pattern data input in said inputting step and on results of said determining step and said judging step;

ascertaining whether or not a finishing allowance is specified, and if the finishing allowance is specified, calculating a shape and size of the workpiece together with the finishing allowance;

processing a machining pattern, before the workpiece has finished undergoing a machining process other than the current machining process, based on a result ascertained in said ascertaining step;

identifying the pattern;

identifying the current machining process to be performed;

deciding whether or not material should be measured; and

performing the current machining process.

5,815,401

FREE-FORM CURVE INTERPOLATION METHOD AND APPARATUS

Toshiaki Otsuki, Minamitsuru-gun; Haruhiko Kozai, and Yoshiyuki Wakinotani, both of Oshino-mura, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

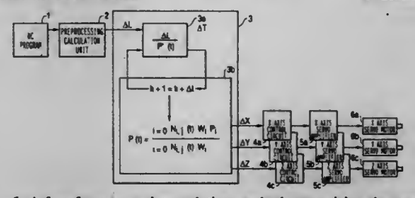
PCT No. PCT/JP96/01228, § 371 Date Dec. 23, 1996, § 102(e) Date Dec. 23, 1996, PCT Pub. No. WO96/35980, PCT Pub. Date Nov. 14, 1996

PCT Filed May 9, 1996, Ser. No. 765,754

Claims priority, application Japan, May 9, 1995, 7-110673

Int. Cl.[6] G05B *19/4099*

U.S. Cl. 364—474.31 **5 Claims**



1. A free-form curve interpolation method, comprising the steps of:

(1) recognizing a NURBS (Non-Uniform Rational B-Spline) curve interpolation command included in a NC Program:

(2) calculating a distance to move during an interpolation period on the basis of a feed rate command in said recognized interpolation command;

(3) calculating a change in a parameter brought on when moving by the distance calculated in said step (2) from a current position specified by a current parameter value;

(4) calculating a position to be specified by a parameter which is obtained by adding the amount of the change of the parameter calculated in said step (3) to the current parameter of said step (3), on the basis of a defining formula of said NURBS curve;

(5) calculating a movement amount of each axis for moving to said position calculated in said step (4), and then outputting an interpolation pulse to each axis; and

(6) repeating said step (3) using said position of said step (4) as said current parameter value.

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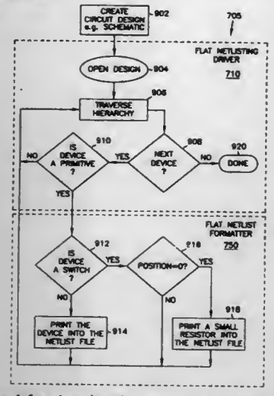
5,815,402

SYSTEM AND METHOD FOR CHANGING THE CONNECTED BEHAVIOR OF A CIRCUIT DESIGN SCHEMATIC

Ronald L. Taylor, Meridian, and Larren Gene Weber, Calwell, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 7, 1996, Ser. No. 660,110
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—488 **41 Claims**



1. A method for changing the connected behavior of a circuit design schematic by interpreting instance parameters at the time a netlist file is being created from a schematic data file representing the circuit design schematic, wherein the circuit design schematic includes a plurality of instances defined at different levels of hierarchy, said method comprising:

in at least one of the instances, defining an instance of a switch having associated first and second nets;

entering a parameter into the schematic data file for each instance of a switch to indicate the condition of the switch, the parameter having a first value for representing a closed switch condition when the associated first and second nets are connected together, and a second value for representing an open switch condition;

creating a netlist file from the schematic data file, including the steps of traversing the hierarchy of the schematic to locate each of the instances in sequence;

checking each instance located to determine if the instance includes an instance of a switch;

evaluating the parameter for each instance that includes an instance of a switch; and,

modifying the interconnectivity of the first and second nets associated with the instance of the switch for each instance of a switch for which the parameter evaluates to said first value.

5,815,403

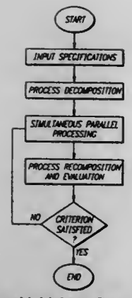
FAIL-SAFE DISTRIBUTIVE PROCESSING METHOD FOR PRODUCING A HIGHEST FITNESS CELL PLACEMENT FOR AN INTEGRATED CIRCUIT CHIP

Edwin R. Jones, Sunnyvale; James S. Koford, San Jose; Douglas B. Boyle, Palo Alto; Ranko Scepanovic, Cupertino, and Michael D. Rostoker, Boulder Creek, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 19, 1994, Ser. No. 229,954
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489 **8 Claims**

1. A physical design automation system for producing a highest fitness cell placement for an integrated circuit chip, comprising:

a decomposition/recomposition processor for decomposing a cell placement optimization process into a plurality of tasks



and recomposing said highest fitness cell placement from results of performing said tasks;

a plurality of worker processors for independently performing tasks and producing results; and

a host processor for distributively assigning said tasks to the worker processors in response to work requests received therefrom, wherein the host processor maintains a list of unassigned tasks, assigned tasks and completed tasks, and revises said list to redesignate assigned tasks as unassigned tasks in accordance with a predetermined criterion;

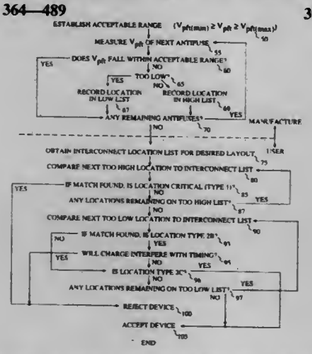
each worker processor sending a work request to the host processor after completing a task.

5,815,404

METHOD AND APPARATUS FOR OBTAINING AND USING ANTIFUSE TESTING INFORMATION TO INCREASE PROGRAMMABLE DEVICE YIELD

F. Erich Goetting, Cupertino; David P. Schultz, San Jose, and David B. Squires, Palo Alto, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Oct. 16, 1995, Ser. No. 543,531
Int. Cl.[6] G01R *31/07;* **G06F** *17/18;* **G11C** *29/00*
U.S. Cl. 364—489 **39 Claims**



1. A method of categorizing an antifuse-based programmable logic device, said method comprising the steps of:

testing said device for imperfections, before programming the device, by determining whether each one of a plurality of unshort circuited antifuses on said device is less likely than a predetermined likelihood to properly program; and

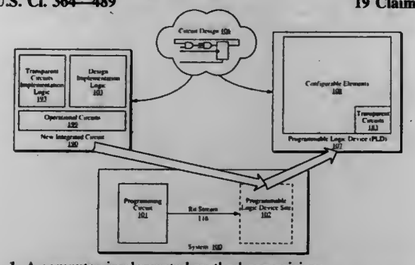
recording said imperfections.

5,815,405

METHOD AND APPARATUS FOR CONVERTING A PROGRAMMABLE LOGIC DEVICE REPRESENTATION OF A CIRCUIT INTO A SECOND REPRESENTATION OF THE CIRCUIT

Glenn A. Baxter, Ben Lomond, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Mar. 12, 1996, Ser. No. 614,113
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489 **19 Claims**



1. A computer implemented method comprising:

accessing a first representation of a circuit, said first representation for programming said programmable logic device to implement said circuit, said programmable logic device having a plurality of configurable elements, said plurality of configurable elements including a first configurable element;

generating a plurality of general model instances which correspond to said plurality of configurable elements;

accessing a first portion of said first representation, said first portion for programming said first configurable element;

identifying a first general model instance which corresponds to said first configurable element; and

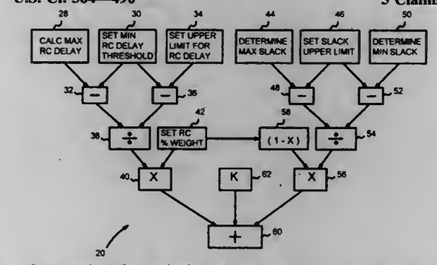
configuring said first general model instance using said first portion, thereby forming part of a second representation of said circuit.

5,815,406

METHOD AND SYSTEM FOR DESIGNING A CIRCUIT USING RC AND TIMING WEIGHTING OF NETS

Robert Thaddeus Golla, Plano, and Christopher Hans Olson, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1996, Ser. No. 620,734
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—490 **5 Claims**



1. A method for designing an integrated circuit including the steps of:

identifying a plurality of nets having blocks of circuit components connected by conductive elements;

assigning weights to the plurality of nets in proportion to a combination of timing and resistive-capacitive (RC) effects therein, the step of assigning weights including the steps of:

calculating a worst case resistive-capacitive delay (Net_RC) of a sink pin of a net under consideration,

setting a minimum resistive-capacitive delay threshold (Min_RC_Design) associated with the pin of the net under consideration,

subtracting the minimum resistive-capacitive delay threshold (Min_RC_Design) from the worst case resistive-capacitive delay (Net_RC) of a sink pin of the net under consideration to acquire a first difference term (Net_RC–Min_RC_Design),

setting an upper limit for resistive-capacitive delay of the net (UPPER_RC),

subtracting the minimum resistive-capacitive delay threshold from the upper limit (UPPER_RC) to acquire a second difference term (UPPER_RC–Min_RC_Design),

dividing the first difference term by the second difference term to acquire a first ratio (Net_RC–Min_RC_Design)/(UPPER_RC–Min_RC_Design),

setting a relative percentage weight (FRAC_RC) to assign to RC delay values versus SLACK values representing a difference between a measured arrival time of a logical result and an expected arrival time of the result for the net under consideration,

multiplying the first ratio by the relative percentage weight (FRAC_RC) times 100 to acquire a first sum term,

determining a maximum or worst SLACK of the net under consideration (Net SLACK),

setting an upper limit on SLACK (UPPER_SLACK),

subtracting the Net SLACK from the UPPER_SLACK to acquire a third difference term,

determining the minimum SLACK associated with any net within the circuit (Min_SLACK_Design),

subtracting the minimum SLACK associated with any net from the UPPER_SLACK to acquire a fourth difference term,

dividing the third difference term by the fourth difference term to acquire a second ratio,

multiplying the second ratio by (1-FRAC_RC) times 100 to acquire a second sum term,

adding the first and the second sum terms, and

adding a constant to the first and the second sum terms to acquire a weight for the net; and

selecting locations for the circuit components to reduce the length of a plurality of wires therebetween in accordance with the weights, the step of selecting locations for the circuit components including the step of running a placement program using the weight for the net.

5,815,407

METHOD AND DEVICE FOR INHIBITING THE OPERATION OF AN ELECTRONIC DEVICE DURING TAKE-OFF AND LANDING OF AN AIRCRAFT

James R. Huffman, Austin, Tex.; Ronald D. Cruickshank, Durham, N.C.; Shrirang Nikanth Jambhekar, Schaumburg, Ill.; Jeffrey Van Myers, Driftwood, and Russell L. Collins, Austin, both of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 14, 1995, Ser. No. 572,603
Int. Cl.[6] G08B *21/00;* **B64C** *19/00*
U.S. Cl. 364—492 **31 Claims**

1. A method for inhibiting operation of an electronic device which performs non-aircraft function during take-off and landing of an aircraft, comprising the steps of:

(a) sensing a parameter indicative of at least one of take-off and landing;

(b) determining if the parameter indicative of at least one of take-off and landing exceeds a predetermined threshold; and

(c) when the parameter indicative of at least one of take-off and landing exceeds the predetermined threshold for a predeter-

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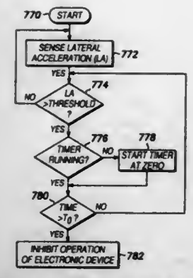


mined period of time, inhibiting operation of the electronic device which performs non-aircraft function.

5,815,408

Patent Not Issued For This Number

5,815,409

CONTROL SYSTEM AND METHOD FOR AUTOMATIC SHUTDOWN OF A POWER SUPPLY

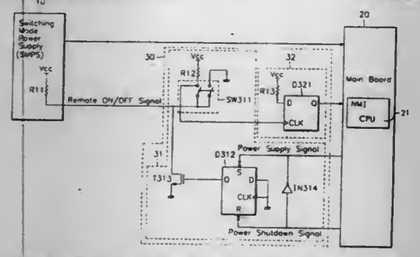
Hyung-Han Lee, Suwon-Si, and Yong-Seok Shin, Seoul, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 29, 1996, Ser. No. 738,786

Claims priority, application Rep. of Korea, Nov. 30, 1995, 1995 45629

Int. Cl.[6] G06F *1/26*

U.S. Cl. 364—528.21 **17 Claims**



10. A control system for auto shutdown of a power supply, comprising:

a switching mode power supply for converting an AC voltage into a DC voltage when turned on;

a power switch for supplying a remote ON/OFF signal having a low logic value to said switching mode power supply when switched from an open state to a closed state, said switching mode power supply being turned on in response to said remote ON/OFF signal having said low logic value;

means for generating an interrupt signal in response to said power switch being switched from said closed state to said open state;

a main board for receiving said DC voltage generated by said switching mode power supply, said main board generating a power supply signal having a low logic value upon receipt of said DC voltage, said main board performing an interrupt service routine and power shutdown operation in response to said interrupt signal and generating a power shutdown signal having a low logic value when said interrupt service routine and power shutdown operation is completed, said main board comprising, a central processing unit having a non-maskable interrupt terminal for receiving said interrupt signal; and

means for turning said switching mode power supply off in response to said power shutdown signal.

5,815,410

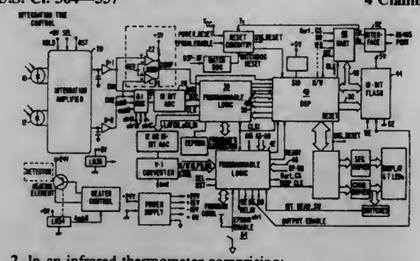
RATIO TYPE INFRARED THERMOMETER

Thomas Heinke, Santa Cruz; Jose Ysaguirre, Soquel; Steve King, and Paul Carlson, both of Santa Cruz, all of Calif., assignors to Raytek Subsidiary, Inc., Santa Cruz, Calif.

Filed May 3, 1996, Ser. No. 643,222

Int. Cl.[6] G01J *5/10*

U.S. Cl. 364—557 **4 Claims**



2. In an infrared thermometer comprising:

a detector assembly including first and second photodiodes, with the first and second photodiodes for receiving incident IR radiation in first and second different IR wavebands and for generating first and second output current signals indicating a magnitude of the intensity of radiation in the first and second IR wavebands, respectively, incident on the first and second photodiodes;

a first integrating amplifier, having an input coupled to receive the first output current signal, an output for providing a first output voltage signal, an RESET input for receiving an RESET signal, said first integrating amplifier for halting the integration of said first output current signal when the RESET signal is asserted and for initiating the integration of said first output current signal when said RESET signal is negated and for providing an output voltage signal having a magnitude equal the product of a constant, a time of magnitude T, and the magnitude of said first output current signal, where T is time of integration;

a first sample and hold circuit, having an input coupled to the output of said first integrating amplifier, a strobe input coupled to receive a strobe signal, and an output for providing a sampled voltage level having a magnitude equal to the magnitude of said first output voltage signal when said strobe is asserted, for sampling and holding the first output voltage signal as a first sampled voltage level when the strobe signal is asserted;

a first comparator, having a first input coupled to receive said first output voltage signal, a second input for receiving a reference voltage signal having a magnitude in the upper range of the dynamic range of said analog to digital converter, and an output signal for providing a first COMP signal, said comparator for asserting said first COMP signal when the magnitude of the first output voltage signal is equal to the magnitude of the output voltage signal;

a second integrating amplifier, having an input coupled to receive the second output current signal, an output for providing a second output voltage signal, an RESET input for receiving a RESET signal, said second integrating amplifier for halting the integration of said second output current signal when the RESET signal is asserted and for initiating the integration of said second output current signal when said RESET signal is negated and for providing an output voltage signal having a magnitude equal the product of a constant, a time of magnitude T, and the magnitude of said second output current signal, where T is time of integration;

a second sample and hold circuit, having an input coupled to the output of said second integrating amplifier, a strobe input coupled to receive a strobe signal, and an output for providing a sampled voltage level having a magnitude equal to the magnitude of said second output voltage signal when said strobe is asserted, for sampling and holding the second output voltage signal as a second sampled voltage level when the strobe signal is asserted;

a second comparator, having a second input coupled to receive said second output voltage signal, a second input for receiving a reference voltage signal having a magnitude in the upper range of the dynamic range of said analog to digital converter, and an output signal for providing a second COMP signal, said comparator for asserting said second COMP signal when the magnitude of the second output voltage signal is equal to the magnitude of the output voltage signal;

an analog to digital convertor, having an analog signal input and a digital output, and characterized by a dynamic range, for converting the magnitude of a provided sampled voltage level to a digital representation and for providing said digital representation as a digital ADC output signal;

a multiplexer, having first and second inputs coupled to said first and second sample and hold circuits to receive said first and second sampled voltage levels and having an output coupled to the analog signal input of said analog to digital convertor, for controllably providing either said first or second sampled voltage level as a provided voltage level to said analog to digital convertor;

a counter, having a clock input for receiving a clock signal consisting of a series of clock pulses separated by selected constant time duration, having a count output for providing a count signal, and having a start input for receiving a START pulse, said counter for counting said clock pulses when said START pulse is negated so that the count signal has a magnitude encoding the number of pulses counted and for terminating counting when said START pulse is asserted;

a flip-flop having a clock input coupled to receive said clock signal, a data input coupled to receive said first and second COMP signals, and an output coupled to the RESET input of said integrating amplifier, the strobe input of said sample and hold circuit, and the START input of said counter, for asserting an FF output signal as said START pulse in coincidence with a first clock pulse received after assertion of either said first or second COMP signal to stop said counter to generate measured count signal and to sample and hold the output voltage signal so that the magnitude of the measured count signal precisely indicates the magnitude of T to facilitate accurate scaling of the digital representation of said output voltage signal to generate a digital representation of the magnitude of the input current signal.

5,815,411

ELECTRO-OPTIC VISION SYSTEM WHICH EXPLOITS POSITION AND ATTITUDE

John Ellenby, and Thomas William Ellenby, both of Palo Alto, Calif., assignors to Criticom Corporation, San Francisco, Calif.

Filed Sep. 10, 1993, Ser. No. 119,360

Int. Cl.[6] G09G *1/00;1/28;* **G01C** *11/26*

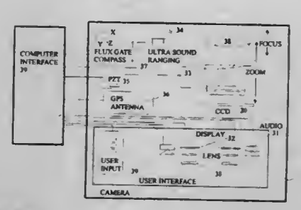
U.S. Cl. 364—559 **5 Claims**

1. An electro-optic apparatus for producing an augmented image from an image of a real scene and a computer generated image, the augmented image being aligned to the scene such that the directions up, down, left and right of the augmented image correspond directly with up, down, left and right of the real scene and the normal direction of the image plane points in a direction away from the user and towards the scene, said augmented image being comprised of information generated by an imaging means and information recalled from a data store, the information being particular to the position as determined by the apparatus and attitude of the apparatus, which comprises:

an imaging means;

a position determining means;

an attitude determining means;



a data store;

a computer; and

a display,

said imaging means having an optic axis which is a symmetry axis and defines the direction of viewing, a lens symmetric about that axis which defines an image field, and a charge coupled device in the image field;

said position determining means having a reference point corresponding to said imaging means;

said attitude determining means having a reference direction parallel to the direction of viewing of said imaging means;

said data store having memory locations wherein prerecorded data are stored, a plurality of orthogonal variables which identify those memory locations, and a pointer responsive to values from the position and attitude determining means which selects particular memory locations containing particular prerecorded data corresponding to the real scene;

said computer being in electronic communication with said imaging means, position and attitude determining means, data base, and display, having graphics and image processing capabilities; and

said display being an elecro-optic emissive display having a normal direction orthogonal to the display plane, the normal direction being colinear with the symmetry axis of the imaging means and being in communication with said computer.

5,815,412

Patent Not Issued For This Number

5,815,413

INTEGRATED METHOD FOR CHAOTIC TIME SERIES ANALYSIS

Lee M. Hively, Philadelphia, and Esmond G. Ng, Concord, both of Tenn., assignors to Lockheed Martin Energy Research Corporation, Oak Ridge, Tenn.

Filed May 8, 1997, Ser. No. 853,226

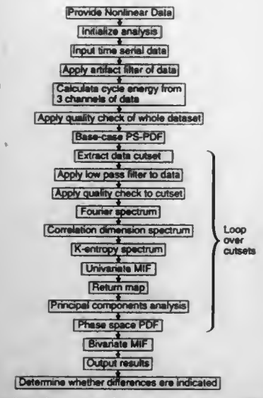
Int. Cl.[6] A61B *5/00*

U.S. Cl. 364—574 **20 Claims**

15. A method for automatically discriminating between similar but different states in a nonlinear process comprising the steps of:

(A) Operating a data provision means selected from the group consisting of data storage means and data acquisition means to provide at least one channel of nonlinear data, called e-data;

VOL 1214 ISS 5 SEP 29 1998 UMI



(B) Separating the e-data into artifact data, called f-data, and artifact-free data, called g-data, while preventing phase distortions in the data;

(C) Processing g-data through a filter to produce a filtered version of g-data, called h-data;

(D) Applying the lag derived from the first minimum in the mutual information function to create a d-dimensional probability density function which forms a high-dimensional topology for at least one type of data selected from the group consisting of e-data, f-data, g-data, and h-data whereby at least one indicative trend can be determined;

(E) Generating a key from the set of indices of each bin in the multidimensional probability density function;

(F) Representing occupied bins from the same class by a linked list to provide a reduction in the number of elements to be stored in the manner known as hashing whereby at least one hashed discriminating trend can be determined;

(G) Comparing at least one indicative trend with at least one known discriminating indicator;

(H) Determining from said comparison whether differences between similar but different states are indicated; and

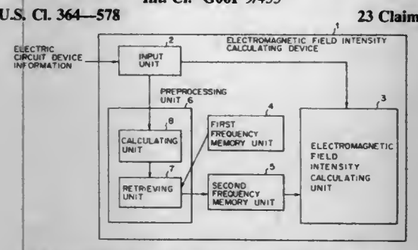
(I) Providing notification whether differences between similar but different states are indicated,

Said discriminating indicator being hashed, and Steps B, C, D, E, F, G, and H being accomplishable in one integrated sequence of computer analyses.

5,815,414
ELECTROMAGNETIC FIELD INTENSITY CALCULATING DEVICE

Kazuki Funaki, and Tomoyuki Nakao, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 20, 1995, Ser. No. 546,535
Claims priority, application Japan, Oct. 21, 1994, 6-256372
Int. Cl.[6] G06F *9/455*
U.S. Cl. 364—578 **23 Claims**



1. An electromagnetic field intensity calculating device for simulating electromagnetic field intensity generated by an object electric circuit device with a wave source by processing an object frequency generated by the object electric circuit device to simulate the electromagnetic field intensity for the object frequency, comprising:

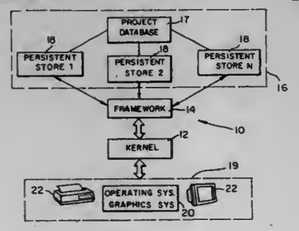
calculating means for calculating a resonant frequency of the object electric circuit device; and

retrieving means for retrieving from a plurality of object frequencies that harmonic frequency of a frequency generated by the wave source which is approximate to the resonant frequency calculated by said calculating means.

5,815,415
COMPUTER SYSTEM FOR PORTABLE PERSISTENT MODELING

Keith Bentley, Glenmore, Pa.; Samuel Wilson, Wilmington, Del.; Earlin Lutz, West Chester, Pa.; James Bartlett, Elverson, Pa., and John Gooding, Spring City, Pa., assignors to Bentley Systems, Incorporated, Exton, Pa.

Filed Mar. 6, 1996, Ser. No. 612,622
Int. Cl.[6] G06F *9/455*
U.S. Cl. 364—578 **27 Claims**



1. A computer system for modeling, the computer system comprising:

a storage device;

first and second platforms interfaced to the storage device, each platform for providing system-dependent services, the first platform having a first type of operating system and a first type of computer hardware including a first memory, the second platform having a second type of operating system and a second type of computer hardware including a second memory;

a portable persistent model residing in the storage device in a platform-independent format, the model including persistent component objects;

a first platform-dependent computerized modeling system (CMS) residing in the first memory of the first platform and a second platform-dependent CMS residing in the second memory of the second platform, each CMS for providing CMS services including retrieving the model from the storage device, manipulating the model, changing the model by adding and removing persistent objects, and persistently saving the model to the storage device.

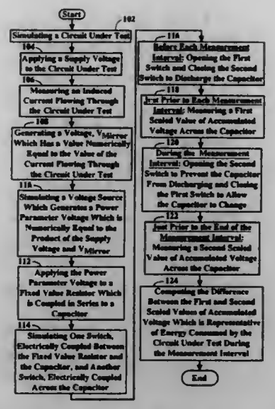
5,815,416
METHOD OF MEASURING ENERGY CONSUMPTION IN A CIRCUIT SIMULATOR

Peter Liebmann, Redwood City; Michael N. Misheloff, Dublin, and David C. Chapman, Santa Clara, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 19, 1996, Ser. No. 634,798
Int. Cl.[6] G01R *21/06;* **G06F** *17/50*
U.S. Cl. 364—578 **12 Claims**

1. In a computer implemented electrical circuit simulator, a method for measuring energy consumption of a simulated circuit under test during a predetermined time interval, comprising the computer implemented steps of:

applying a supply voltage to the circuit under test;



determining a current flowing through the circuit under test when the supply voltage is applied;

generating a second voltage which is a function of the value of the current flowing through the circuit under test;

simulating a voltage source which generates a third voltage equal to the product of the supply voltage and the second voltage;

applying the third voltage to a first terminal of a fixed value resistor which has a second terminal coupled to a capacitor;

simulating a first switch, electrically coupled between the fixed value resistor and the capacitor, and simulating a second switch, electrically coupled across the capacitor, wherein the first and second switches are implemented in the simulator with voltage variable resistors;

opening the first switch during time intervals other than during the predetermined time interval;

closing the second switch during time intervals other than during the predetermined time interval in order to discharge the capacitor;

opening the second switch during the predetermined time interval to prevent the capacitor from discharging;

closing the first switch during the predetermined time interval to allow the capacitor to charge during the predetermined time interval; and

measuring a fourth voltage across the capacitor, wherein the fourth voltage is representative of energy consumed by the circuit under test.

5,815,417
METHOD FOR ACQUIRING AND PRESENTING DATA RELEVANT TO AN EMERGENCY INCIDENT

Wilson W. Orr, Mayer, and Raymond M. P. Miller, Scottsdale, both of Ariz., assignors to City of Scottsdale, Scottsdale, Ariz.

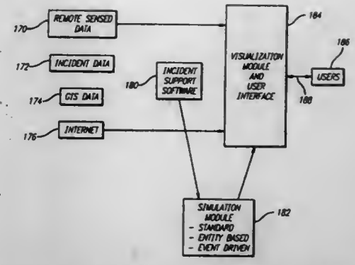
Continuation-in-part of Ser. No. 735,336, Oct. 22, 1996, Pat. No. 5,652,717, which is a continuation of Ser. No. 285,830, Aug. 4, 1994, abandoned. This application Jul. 25, 1997, Ser. No. 900,177
Int. Cl.[6] G06T *17/50*
U.S. Cl. 364—578 **24 Claims**

1. A method for collecting data and presenting facts attendant an emergency incident and simulation scenarios to assist decision-makers to minimize the public risk arising from the emergency incident, said method comprising the steps of:

(a) acquiring factual natural and man-made emergency incident information on a real time basis;

(b) identifying subject matter of the real time factual information;

(c) ingesting and storing the identified factual information;



(d) retrieving pre-existing factual emergency information of selected subject matter from a source;

(e) correlating selected ingested information with corresponding retrieved information;

(f) compiling the correlated information;

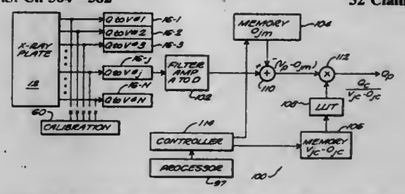
(g) analyzing the compiled information to obtain simulation scenarios of the impact upon the emergency incident due to either actual or anticipated variations of the factual information; and

(h) selectively presenting the compiled or analyzed information for review and study.

5,815,418
CONTINUOUS SELF-CALIBRATING DATA ACQUISTION SYSTEM

Enrico Dolazza, Boston, and Roger Finch, Ipswich, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed Jan. 31, 1996, Ser. No. 594,424
Int. Cl.[6] H04N *1/40*
U.S. Cl. 364—582 **32 Claims**



1. A data acquisition system including a plurality of data acquisition channels, said system comprising:

A. a plurality of signal converters, each of said converters (a) having an input and an output, (b) being disposed within at least a corresponding one of said channels and (c) having an input-output transfer function characterized by an associated (i) offset and (ii) a gain function, whereby an input signal provided to each of said converters produces an associated output value as a function of said associated offset and said gain function;

B. means for measuring the associated offset and gain function of each of said converters;

C. memory means for storing values as a function of the measured offset and gain function for each of said converters; and

D. means for generating a compensated value, representative of said input signal to said converter, as a function of said stored values and said associated output value, so that said compensated value is substantially independent of said associated offset and gain function of each of said converters.

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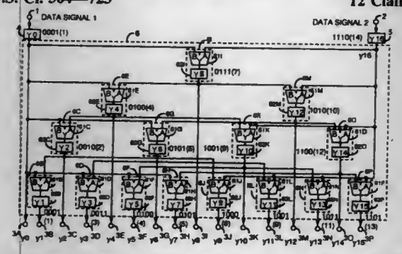
5,815,419
DATA INTERPOLATING CIRCUIT

Masako Fujitomi, and Hiroyuki Harada, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1996, Ser. No. 689,831
Claims priority, application Japan, Mar. 28, 1996, 8-073805
Int. Cl.[6] G06F 7/30
U.S. Cl. 364—723 12 Claims



1. A data interpolating circuit for generating n digital data signals from two digital data signals by interpolating (n−1) data between said two digital data signals comprising:

a first hold circuit for holding a first data signal and a second hold circuit for holding a second data signal;

(n−1) computing means each having a computing circuit for computing a mid value of the two inputted digital signals and a hold circuit for holding the computed mid value; wherein

said (n−1) computing means are connected so that a mid value yi held by a hold circuit of an i-th computing means is expressed by following general equations,

$Yi=(Y_0+Y_{2i})/2$:in case $i\leqq n/2$

$Yi=(Y_{(2i-n)}+Yn)/2$:in case $i>n/2$;

where an interpolating number n equals 2^Z and Z is a positive real number, an integer i is larger than 0 and smaller than n (0<i<n), a 0-th output data signal Y_0 is said first data signal, an n-th output data signal Y_n is said second data signal, an output data signal Y_{2i} from a 2i-th computing means is a mid value held by a hold circuit of the 2i-th computing means, an output data signal $Y_{(2i-1)}$ from a (2i−n)-th computing means is a mid value held by a hold circuit of the (2i−n)-th computing means.

5,815,420
MICROPROCESSOR ARITHMETIC LOGIC UNIT USING MULTIPLE NUMBER REPRESENTATIONS

Donald E. Steiss, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1997, Ser. No. 903,846
Int. Cl.[6] G06F 7/38;7/00
U.S. Cl. 364—736.04 19 Claims

1. A microprocessor, comprising:

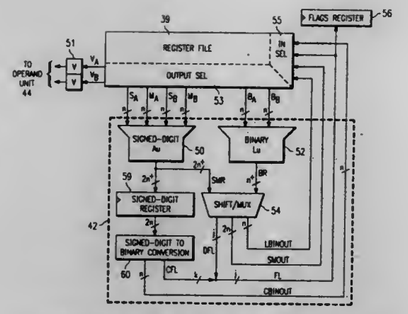
a register file, having a plurality of entries, each entry having a binary portion for storing an operand in a binary form, and having a redundant portion for storing the operand in a redundant form; and

an arithmetic logic unit, coupled to the register file, for executing arithmetic and logical instructions upon operands stored in the register file, comprising:

a binary logical unit, for receiving operands in the binary form from selected entries in the register file, and for executing a logical operation thereupon;

a redundant arithmetic unit, for receiving operands in the redundant form from selected entries in the register file, and for executing an arithmetic operation thereupon;

a select circuit, having inputs coupled to outputs of the binary logical unit and the redundant arithmetic unit, and having



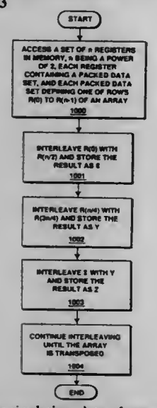
an output coupled to the register file, for forwarding results of the logical operation from the binary logical unit to the register file in both the binary form and in the redundant form, and for forwarding results of the arithmetic operation from the redundant arithmetic unit to the register file in the redundant form; and

a conversion circuit, having an input coupled to the redundant arithmetic unit and having an output coupled to the register file, for converting results of the arithmetic operation from the redundant form into the binary form, and for forwarding the converted results of the arithmetic operation to the register file.

5,815,421
METHOD FOR TRANSPOSING A TWO-DIMENSIONAL ARRAY

Carole Dulong, Saratogo, Calif.; Alexander D. Peleg, Carmelia, Israel, and Larry M. Mennemeler, Boulder Creek, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 18, 1995, Ser. No. 573,631
Int. Cl.[6] G06F 17/10
U.S. Cl. 364—736.03 37 Claims



1. A method of manipulating data elements in transposing an array of n rows, R(0) to R(n−1), each row comprising a plurality of data elements, the method comprising the computer-implemented steps of:

interleaving a plurality of data elements from a first row with a plurality of data elements from a second row to generate a first result, the data elements from the first and second rows representing signals generated by an input device coupled to the computer;

interleaving a plurality of data elements from a third row with a plurality of data elements from a fourth row to generate a

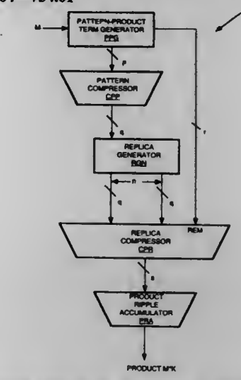
second result, the data elements from the third and fourth rows representing signals generated by the input device; and

interleaving a plurality of data elements from the first result with a plurality of data elements from the second result to generate a third result.

5,815,422
COMPUTER-IMPLEMENTED MULTIPLICATION WITH SHIFTING OF PATTERN-PRODUCT PARTIALS

Kenneth A. Dockser, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jan. 24, 1997, Ser. No. 789,156
Int. Cl.[6] G06F 7/52;7/00
U.S. Cl. 364—754.01 5 Claims



1. A constant multiplication device for multiplying a multiplicand by a constant multiplier having a repeating digit pattern with at least three non-zero values at respective digit positions, said multiplication device comprising:

a pattern-product term generator for generating pattern-product terms that collectively determine the product of said multiplicand and said pattern, at least one of said pattern-product terms being generated for each non-zero value of said pattern, said pattern-product term generator having an input for receiving said multiplicand;

a pattern-product compressor for calculating as a function of said pattern-product terms a set of pattern-product partials that collectively determine the product of said multiplicand and said pattern, said pattern compressor being coupled to said pattern-product term generator for receiving said pattern-product terms;

a replica generator for generating relatively shifted replicas of said pattern-product partials, said replica generator being coupled to said pattern compressor for receiving said pattern-product partials;

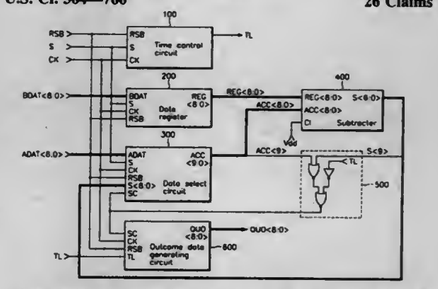
a replica compressor for calculating, at least in part as a function of said shifted replicas, final-product partials that collectively correspond to the product of said multiplicand and said multiplier, said replica compressor being coupled to said replica for receiving said shifted replicas; and

a ripple accumulator for calculating said product from said final-product partials, said ripple accumulator being coupled to said replica compressor for receiving said final-product partials.

5,815,423
PARALLEL PROCESSING DIVISION CIRCUIT

Young-chul Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Apr. 29, 1996, Ser. No. 638,862
Claims priority, application Rep. of Korea, Oct. 31, 1995, 1995-38701
Int. Cl.[6] G06F 7/52
U.S. Cl. 364—766 26 Claims



1. A parallel processing division circuit, which receives dividend data, divisor data which is larger than the dividend data, a starting signal and a reset signal, comprising:

a time control circuit which receives said starting signal and a clock signal and outputs a time control signal which controls a time to output outcome data of division;

a data register which receives said divisor data and outputs divisor storing data which is the inverse of said divisor data and is synchronized with the clock signal according to the starting signal;

a data select circuit which receives said dividend data, subtraction outcome data, said starting signal and said clock signal, and which selects data which is one of said dividend data and existing subtraction outcome data which is shifted to the left one bit according to said starting signal, thereby outputting select data and control data;

a subtractor which receives said divisor storing data and said select data, performs subtraction, and outputs said subtraction outcome data and an output carry which indicates if overflow has occurred as a result of the subtraction;

a control signal generating circuit which receives said time control signal, said control data and said output carry, and outputs a select control signal having a high logic value when said time control signal has a high logic value and when one of said control data and said output carry has a high logic value; and

an outcome data generating circuit which receives said time control signal, said select control signal and said clock signal, is synchronized with said clock signal according to the time control signal, stores said select control signal at the third bit and outputs outcome data by shifting the select control signal to the left one bit by one bit.

5,815,424
DIGITAL ANGLE CONVERSION METHOD

Hiroshi Kushihara, Nagano-ken, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Nagano-ken, Japan

Filed Dec. 10, 1997, Ser. No. 988,134
Claims priority, application Japan, Sep. 11, 1997, 9-246915
Int. Cl.[6] G06G 7/22
U.S. Cl. 364—817 4 Claims

1. A digital angle conversion method in which a digital angle output (ϕ) is obtained from a rotating signal (sinθ·f(t), cosϕ·f(t), where f(t): an exciting component) obtained by a rotating detector (1), characterized in that the rotating signal (sinθ·f(t), cosϕ·f(t)) is introduced into a sin·cos multiplier (2) and mutually operated with sinϕ and cosϕ obtained from the digital angle output (ϕ) to obtain a first output signal (sin(θ−ϕ)·f(t)) as the result of

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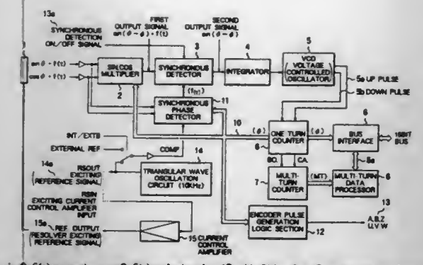


$\sin\theta \cdot f(t) \times \cos\phi - \cos\theta \cdot f(t) \times \sin\phi = \sin(\theta-\phi) \cdot f(t)$, the first output signal $(\sin(\theta-\phi) \cdot f(t))$ is synchronously rectified by a synchronous detector (3) to remove the exciting component f(t) so as to obtain a second output signal $(\sin(\theta-\phi))$, the second output signal $(\sin(\theta-\phi))$ passes through an integrator (4) and a voltage controlled oscillator (5) to obtain the digital angle output (ϕ) from a one-turn counter, the digital angle output (ϕ) is input to said sin·cos multiplier (2) and a synchronous phase detector (11) to perform feedback control, control deviation $\epsilon = \sin(\theta-\phi)$ in this feedback control is set to zero to satisfy $\theta = \phi$.

5,815,425

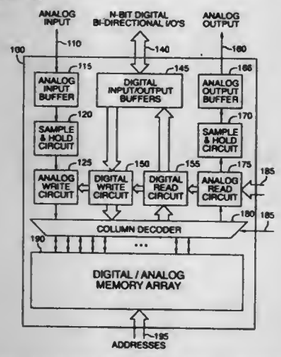
COMBINED DIGITAL WRITE AND ANALOG REWRITE PROCESS FOR NON-VOLATILE MEMORY

Sau C. Wong, Hillsborough, and Hock C. So, Redwood City, both of Calif., assignors to Invox Technology, Campbell, Calif.

Division of Ser. No. 535,441, Sep. 28, 1995, Pat. No. 5,745,409. This application Apr. 30, 1997, Ser. No. 847,234

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—45 **14 Claims**



1. A method for storing data in a memory, comprising:

writing the data in the memory as digital values during acquisition of the data wherein writing stores the digital values in digital form in the memory;

reading the digital values from the memory cells;

converting the digital values as read into analog values using a digital-to-analog converter that is internal to the memory; and

storing the analog values in analog form in the memory.

5,815,426

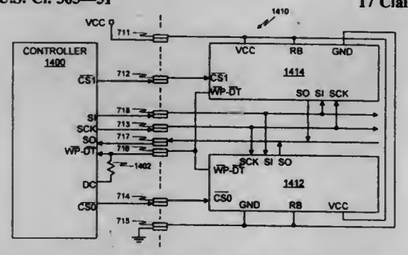
ADAPTER FOR INTERFACING AN INSERTABLE/ REMOVABLE DIGITAL MEMORY APPARATUS TO A HOST DATA PART

Robin J. Jigour, and David K. Wong, both of San Jose, Calif., assignors to Nexcom Technology, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 689,687, Aug. 13, 1996. This application Mar. 25, 1997, Ser. No. 823,937

Int. Cl.[6] G11C *5/02*

U.S. Cl. 365—51 **17 Claims**



1. An adapter for interfacing an insertable/removable serial memory device to a parallel port of a host, comprising:

a parallel port connector having a plurality of electrical contacts designated data;

a socket for receiving the insertable/removable serial memory device, the socket having respective contacts designated clock, data-in, data-out, first chip select, and second chip select; and

a circuit mapping the clock contact, the data-in contact, the data-out contact, the first chip select contact, and the second chip select contact of the socket to respective data contacts of the parallel port connector.

5,815,427

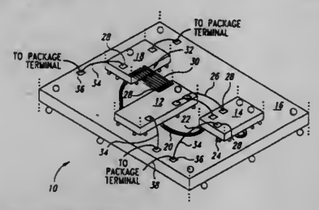
MODULAR MEMORY CIRCUIT AND METHOD FOR FORMING SAME

Eugene H. Cloud; Brent Keeth; Salman Akram; James M. Shaffer, and Alex Closson, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Apr. 2, 1997, Ser. No. 825,871

Int. Cl.[6] G11C *5/02;5/06;8/00*

U.S. Cl. 365—51 **49 Claims**



1. A circuit, comprising:

a memory module that is formed on a first die and that includes an array of memory cells;

a communication module that is formed on a second die and that includes communication circuitry for coupling signals to or from said array; and

an interconnection module that is formed on a third die and that is electrically coupled to said memory and communication modules, said interconnection module including conductive paths that electrically couple said array to said communication circuitry.

5,815,428

SEMICONDUCTOR MEMORY DEVICE HAVING HIERARCHICAL BIT LINE STRUCTURE

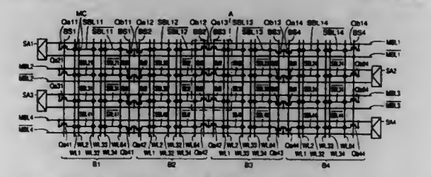
Takahiro Tsuruda, and Masaki Tsukude, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 598,581, Feb. 12, 1996, abandoned. This application Jul. 14, 1997, Ser. No. 893,045

Claims priority, application Japan, Feb. 22, 1995, 7-033918

Int. Cl.[6] G11C *5/06*

U.S. Cl. 365—63 **21 Claims**



1. A semiconductor memory device, comprising:

a semiconductor substrate;

a plurality of sub bit line pairs formed on said semiconductor substrate;

a main bit line pair formed along said plurality of sub bit line pairs in a layer located above said plurality of sub bit line

a plurality of switching portions each provided corresponding to one of one and the other sub bit lines of said plurality of sub bit line pairs, connected between the corresponding sub bit line and one of one and the other main bit lines of said main bit line pair;

a plurality of word lines formed on said semiconductor substrate to cross said plurality of sub bit line pairs;

a plurality of memory cells provided corresponding to intersections of said plurality of sub bit line pairs and said plurality of word lines, each connected to one of one and other sub bit lines of the corresponding sub bit line pair and to corresponding word line,

said plurality of switching portions each including

a selecting transistor formed on said semiconductor substrate and having one source/drain region connected to corresponding sub bit line;

a pad connected to the other source/drain region of said selecting transistor and the corresponding main bit line and formed at an intermediate layer between a layer of said plurality of sub bit line pairs and layer of said main bit line pair.

5,815,429

ANTIFUSE PROGRAMMING METHOD AND APPARATUS

Joseph C. Sher, and Brent Keeth, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 690,777, Aug. 1, 1996, Pat. No. 5,668,751. This application May 20, 1997, Ser. No. 858,945

Int. Cl.[6] G11C *17/00*

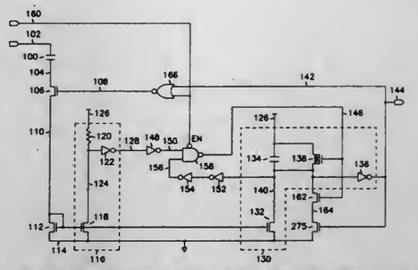
U.S. Cl. 365—96 **17 Claims**

15. A programming circuit for an antifuse, comprising:

a switch, coupled to the antifuse and to a programming current source that provides a programming current;

a first detector, coupled to receive a signal representative of the programming current; and

a delay circuit, responsive to the first detector, that controls the switch to inhibit the programming current from flowing



through the antifuse after a desired time following initial programming of the antifuse.

5,815,430

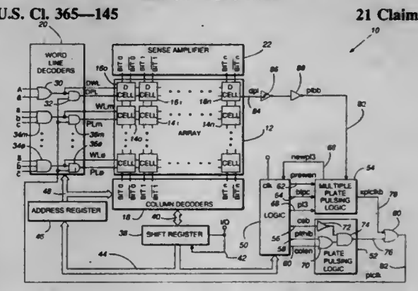
CIRCUIT AND METHOD FOR REDUCING COMPENSATION OF A FERROELECTRIC CAPACITOR BY MULTIPLE PULSING OF THE PLATE LINE FOLLOWING A WRITE OPERATION

Donald J. Verhaeghe, and Steven D. Traynor, both of Colorado Springs, Colo., assignors to Ramtron International Corporation, Colorado Springs, Colo.

Division of Ser. No. 420,293, Apr. 10, 1995, Pat. No. 5,592,410. This application Aug. 1, 1996, Ser. No. 691,132

Int. Cl.[6] G11C *11/22*

U.S. Cl. 365—145 **21 Claims**



17. A ferroelectric memory array device of the type incorporating an array of memory cells coupled between at least one bit line and a plate line, said bit line being coupled between a sense amplifier and a column decoder and said plate line being coupled to a word line decoder, said ferroelectric memory device further incorporating a number of dummy cells coupled to said word line decoder associated with each column of said memory cells and an address register coupled to said column and word line decoders for selecting a desired one of said memory cells in said array comprising:

a dummy plate line signal generating circuit coupled to at least one of said dummy cells for producing a dummy plate line signal,

wherein said dummy plate line signal corresponds directly to a plate line signal of any selected row of said memory cells;

control logic responsive to an input clocking signal;

plate pulsing logic responsive to said control logic for selectively applying a potential to said plate line; and

multiple plate pulsing logic responsive to said control logic and said generating means for selectively applying a reinforcing potential to said plate line at a time determined by said dummy plate line signal.

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5,815,431

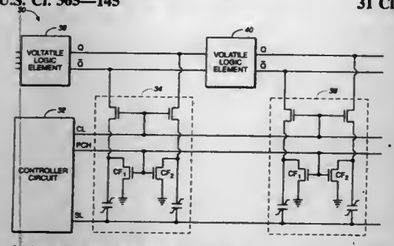
NON-VOLATILE DIGITAL CIRCUITS USING FERROELECTRIC CAPACITORS

Deng-Yuan David Chen, Fremont, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 19, 1997, Ser. No. 802,604

Int. Cl.[6] G11C *11/22*

U.S. Cl. 365—145 **31 Claims**



1. An apparatus including:

a logic circuit including a volatile logic element having a node defining a logic state at a first time, the node of logic element being connected to an input of another volatile logic element of the logic circuit; and

circuitry operatively connected to the volatile logic element, the circuitry including a ferroelectric capacitor, the ferroelectric capacitor defining a voltage versus charge hysteresis curve, the circuitry adapted to set the position of the ferroelectric capacitor on the hysteresis curve depending on a value of the logic state at the node, wherein the value at the node is lost when the power to the apparatus is off and the circuitry is further adapted to restore the value of the logic state at the node of the volatile logic element using the ferroelectric capacitor when power is restored to the apparatus.

5,815,432

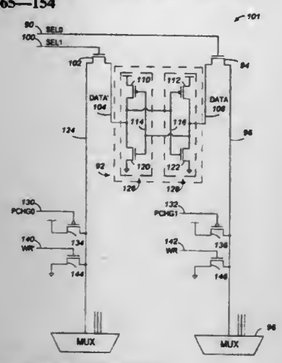
SINGLE-ENDED READ, DUAL-ENDED WRITE SCRAM CELL

Samuel D. Naffziger, and Kevin X. Zhang, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 10, 1997, Ser. No. 891,173

Int. Cl.[6] G11C *11/00;7/00;8/00*

U.S. Cl. 365—154 **8 Claims**



1. A storage memory comprising:

a plurality of bitlines;

a storage element for holding a stored value, said storage element comprising first and second I/O ports which at any given time hold output values that are inverse to one another;

a plurality of independently controlled select switches, each coupled to a different respective one of said plurality of bitlines, and each responsive to a different respective one of a plurality of select signals to couple its respective bitline to one of said first and second I/O ports when said respective select signal is in an active state and to isolate said respective bitline from one said first and second I/O ports when said respective select signal is in an inactive state;

a write mechanism coupled to a first and second bitline of said plurality of bitlines, said first bitline being coupled through a first select switch of said independently controlled select switches to said first I/O port and said second bitline being coupled through a second select switch of said independently controlled select switches to said second I/O port; and

a plurality of sensors, each coupled to a different respective one of said plurality of bitlines, and each sensing said stored value based solely upon said stored value coupled to said respective bitline.

5,815,433

MASK ROM DEVICE WITH GATE INSULATION FILM BASED IN PAD OXIDE FILM AND/OR NITRIDE FILM

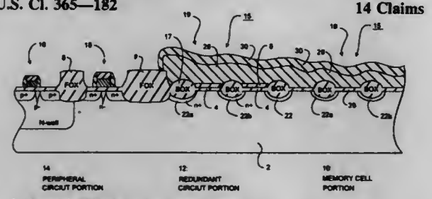
Nobuyoshi Takeuchi, Tokyo, Japan, assignor to NKK Corporation, Tokyo, Japan, and Macronix International Co., Ltd., Hsinchu, Talwan

Filed Dec. 22, 1995, Ser. No. 572,901

Claims priority, application Japan, Dec. 27, 1994, 6-340543

Int. Cl.[6] G11C *11/34;* **H01L** *27/02*

U.S. Cl. 365—182 **14 Claims**



1. A mask ROM device, comprising:

a semiconductor substrate having a pad oxide film formed on a surface thereof and element separation regions formed in the surface oxide of said pad oxide film serving as a base material of said element separation regions;

a memory cell portion including an array of programmed MOS memory cells formed on the semiconductor substrate; and

a redundant circuit portion including MNOS redundant cells formed on the semiconductor substrate;

wherein each of said MNOS redundant cells has a gate insulator containing a part of the pad oxide film which is located between corresponding element separation regions.

5,815,434

MULTIPLE WRITES PER A SINGLE ERASE FOR A NONVOLATILE MEMORY

Robert N. Hasbun, Shingle Springs, Calif., and Frank P. Janecek, London, United Kingdom, assignors to Intel Corporation, Santa Clara, Calif.

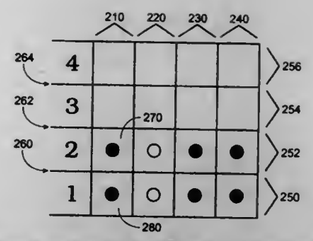
Filed Sep. 29, 1995, Ser. No. 537,132

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.03 **21 Claims**

1. A method of writing to a memory comprising the steps of:

storing a first bit at a first level associated with a first reference threshold of a nonvolatile memory cell; and



storing a superseding second bit at a second level associated with a second reference threshold of the memory cell, without erasing the memory cell.

5,815,435

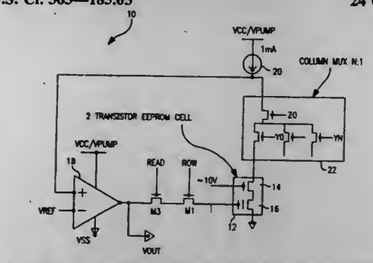
STORAGE CELL FOR ANALOG RECORDING AND PLAYBACK

Hieu Van Tran, San Jose, Calif., assignor to Information Storage Devices, Inc., San Jose, Calif.

Filed Oct. 10, 1995, Ser. No. 540,462

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.03 **24 Claims**



1. A circuit for storing and reading back an analog voltage for integrated circuit signal recording and subsequent playback comprising:

a storage cell having a first transistor and a second transistor, the first transistor having a source, a drain and a gate, the second transistor having a source, a drain, a gate and a floating gate, the drain of the second transistor being connected to the source of the first transistor;

a current source coupled to the drain of the first transistor;

a third transistor having a source, a drain and a gate, the drain of the third transistor being coupled to the current source, the source of the third transistor being coupled to the gate of the second transistor, the gate of the third transistor being coupled to an input signal, the third transistor being responsive to the input signal; and

an output terminal coupled to the drain of the third transistor for providing the analog voltage stored in the storage cell when the third transistor is turned on in response to the input signal.

5,815,436

MULTI-LEVEL NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING IMPROVED PROGRAMMING LEVEL AND READ/WRITE MULTI-LEVEL DATA CIRCUITS

Tomoharu Tanaka, and Hiroaki Hazama, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

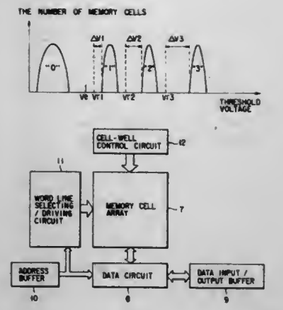
Filed Nov. 13, 1996, Ser. No. 748,401

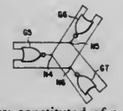
Claims priority, application Japan, Nov. 14, 1995, 7-295136

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.03 **17 Claims**

10. A nonvolatile semiconductor memory device comprising:





a memory cell array constituted of a plurality of memory cells each having a charge storage section for storing n-value data ($n \geqq 3$);

a plurality of bit lines;

a plurality of word lines; and

a plurality of program control circuits, wherein

each of said plurality of program control circuits holds write control data for determining whether a write voltage is to be applied to a corresponding memory cell, selectively applies the write voltage to the memory cell according to held write control data, senses a write state of the memory cell, and selectively changes the held write control data in accordance with a predetermined logical relationship between write state of the memory cell and the write control data, and

each of said plurality of program control circuits includes a data circuit for holding the write control data, said data circuit including n logic circuits each having n−1 input terminals.

5,815,437

DATA INPUT/OUTPUT MANAGING DEVICE, PARTICULARLY FOR A NON-VOLATILE MEMORY

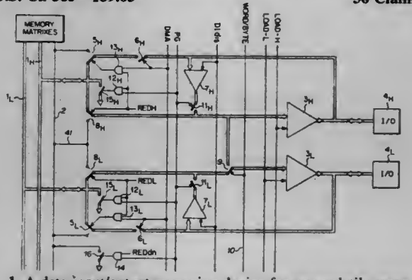
Luigi Pascucci, Sesto San Giovanni; Antonio Barcella, Trescore Balneario; Paolo Rolandi, Voghera, and Marco Fontana, Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 7, 1997, Ser. No. 813,171

Claims priority, application European Pat. Off., Mar. 20, 1996, 96830127

Int. Cl.[6] G11C *11/34;7/00*

U.S. Cl. 365—189.05 **36 Claims**



1. A data input/output managing device for non-volatile memories that comprise at least one matrix of memory cells, the data input/output managing device comprising:

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at least one bidirectional internal bus for the transfer of data from and to said memory matrix;

a redundancy management line that is associated with said internal bus;

means for enabling and disabling transmission, over said internal bus, of data from the memory matrix;

means for enabling and disabling transmission, over said internal bus, of data to the memory matrix; and

means for enabling and disabling a connection to said redundancy line during reading of said memory matrix and during its programming.

5,815,438

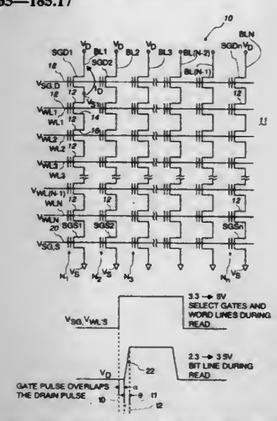
OPTIMIZED BIASING SCHEME FOR NAND READ AND HOT-CARRIER WRITE OPERATIONS

Sameer S. Haddad, San Jose, and Pau-Ling Chen, Saratoga, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 28, 1997, Ser. No. 810,170

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—185.17 **20 Claims**



1. A method for eliminating hot-carrier disturb during a read operation in a NAND memory architecture in which a floating gate device is used as a select gate, said method comprising the steps of:

applying a first positive pulse voltage having a ramp-rate characteristic on its leading edge to the drain of the floating gate device during the read operation; and

simultaneously applying a second positive pulse voltage to the control gate of the floating gate device during the read operation so as to overlap the first positive pulse voltage.

5,815,439

STABILIZATION CIRCUITS AND TECHNIQUES FOR STORAGE AND RETRIEVAL OF SINGLE OF MULTIPLE DIGITAL BITS PER MEMORY CELL

George J. Korsh, Redwood City, and Sakhawat M. Khan, Sunnyvale, both of Calif., assignors to Agate Semiconductor, Inc., Santa Clara, Calif.

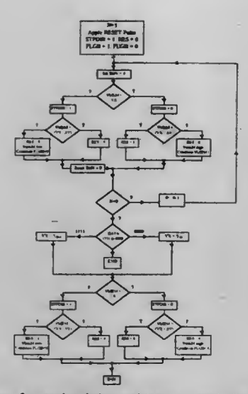
Filed Apr. 30, 1996, Ser. No. 640,367

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.24 **87 Claims**

1. An integrated circuit memory system comprising

a plurality of memory cells, each memory cell storing an amount of electric charge in a preselected range corresponding to digital information; and



circuit means for maintaining said amount of charge in each of said plurality of said memory cells, said maintaining circuit means operative upon a memory cell when an amount of charge stored in said memory cell is outside a preselected range;

whereby loss of digital information in each memory cell is avoided.

5,815,440

SEMICONDUCTOR MEMORY DEVICE WITH ELECTRICALLY CONTROLLABLE THRESHOLD VOLTAGE

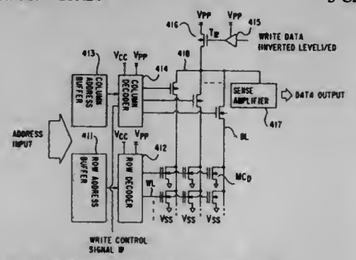
Takao Akaogi; Nobuaki Takashina; Yasushi Kasa; Kiyoshi Itano; Hiromi Kawashima; Minoru Yamashita, and Shouichi Kawamura, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 432,723, Jun. 6, 1995, Pat. No. 5,666,314, which is a division of Ser. No. 79,738, Jun. 22, 1993, Pat. No. 5,452,251. This application Mar. 24, 1997, Ser. No. 822,036

Claims priority, application Japan, Dec. 3, 1992, 4-324284; Dec. 28, 1992, 4-349481; Jan. 5, 1993, 5-000304

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.24 **3 Claims**



1. A semiconductor memory device comprising:

a plurality of word lines;

a plurality of bit lines;

a plurality of nonvolatile memory cells each formed of a MIS transistor disposed-at each intersection of said word lines and said bit lines, and a threshold voltage of said MIS transistor being externally electrically controllable;

a write circuit for writing data to a memory cell located at an intersection of selected ones of said word lines and said bit lines; and

a sense amplifier for reading data out of said memory cells, wherein each word line is controlled such that a drain current of a memory cell transistor connected to said word line is lower than a channel current thereof, when writing data to said cell transistor to increase the threshold voltage of said memory cell transistor to be higher than the potential of an unselected word line.

5,815,441

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

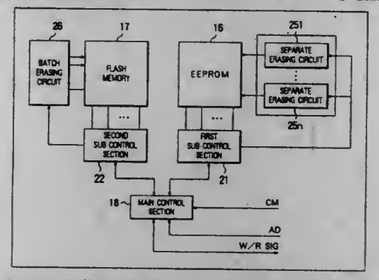
Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1997, Ser. No. 943,413

Claims priority, application Japan, Sep. 30, 1996, 8-259370

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—185.29 **5 Claims**



1. A non-volatile semiconductor memory device comprising a semiconductor substrate, a first non-volatile memory array section formed on said semiconductor substrate and having a plurality of memory cell transistors, a second non-volatile memory array section formed on said semiconductor substrate and having a plurality of memory cell transistors, a first erasing section for erasing said memory cell transistors of said first non-volatile memory array section in a group-by-group mode, a second erasing section for erasing said memory cell transistors of said second non-volatile memory array section in a batch mode, said memory cell transistors of said first and second non-volatile memory array sections having a common structure in source, drain, control gate and floating gate.

5,815,442

DATA TRANSFER APPARATUS WITH LARGE NOISE MARGIN AND REDUCED POWER DISSIPATION

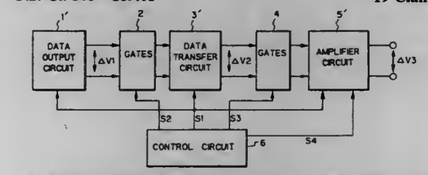
Yoshiharu Aimoto; Tohru Kimura, and Yoshikazu Yabe, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1996, Ser. No. 705,340

Claims priority, application Japan, Aug. 31, 1995, 7-248674

Int. Cl.[6] G11C *16/04*

U.S. Cl. 365—189.01 **19 Claims**



6. A data transfer apparatus powered by a first power supply voltage and a second power supply voltage higher than said first power supply voltage, comprising:

a first input/output circuit including a first data output circuit for generating first complementary output signals and a first amplifier circuit for generating second complementary output signals;

a second input/output circuit including a second data output circuit for generating third complementary output signals and a second amplifier circuit for generating fourth complementary output signals;

a data transfer circuit having a large load capacitance for transferring said first complementary output signals to generate fifth complementary output signals and transferring said third complementary output signals to generate sixth complementary output signals;

a first transfer gate circuit connected between first input/output circuit and said data transfer circuit;

a second transfer gate circuit connected between said data transfer circuit and said second input/output circuit; and

means for causing said first, second, third, fourth, fifth and sixth complementary output signals to be approximately at an intermediate level between said first and second voltages.

5,815,443

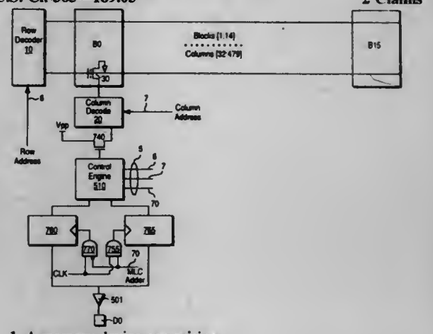
BIT MAP ADDRESSING SCHEMES FOR FLASH MEMORY

Sherif Sweha, El Dorado Hills, and Mark E. Bauer, Cameron Park, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 423,557, Apr. 17, 1996, abandoned, which is a division of Ser. No. 253,902, Jun. 2, 1994, Pat. No. 5,497,354. This application Apr. 19, 1996, Ser. No. 634,953

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.05 **2 Claims**



1. A memory device comprising:

a data input;

a memory cell array arranged in a plurality of rows and columns, the memory cell array comprising a plurality of memory cells wherein each memory cell is operative to store n bits of data, n being greater than 1;

a plurality of address inputs including row address inputs, column address inputs, and multi-level cell (MLC) address input wherein the MLC address input allows each of the n bits stored in a memory cell to be individually addressed;

a row decoder circuit coupled to the plurality of memory cells, wherein the row decoder circuit selects a row of the memory cell array in response to a row address received via the row address inputs;

a column decoder circuit coupled to the plurality of memory cells wherein the column decoder circuit selects a column of the memory cell array in response to a column address received via the column address inputs such that a first memory cell is selected for programming in response to the row and column addresses;

n latches coupled to a control signal, the MLC address input, and the data input, each of the n latches being sequentially enabled to latch data from the data input in response to the MLC address input and the control signal; and

a control engine coupled to the n latches and the memory cell array, the control engine for encoding the data received from

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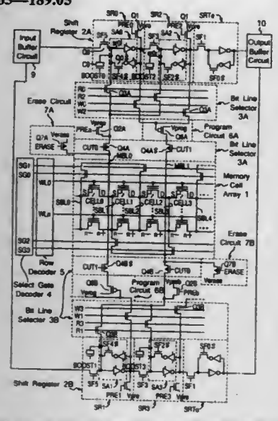
the n latches into a programming level, and for programming the first memory cell selected by the row and column addresses by generating at least one programming pulse until the first memory cell is progammed to have approximately the programming level.

5,815,444

SERIAL ACCESS SYSTEM SEMICONDUCTOR STORAGE DEVICE CAPABLE OF REDUCING ACCESS TIME AND CONSUMPTION CURRENT

Yoshiji Ohta, Kashiwara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1997, Ser. No. 995,272
Claims priority, application Japan, Dec. 27, 1996, 8-349350
Int. Cl.[6] G11C *7/00;8/00;11/34*
U.S. Cl. 365—189.05 **4 Claims**



1. A serial access system semiconductor storage device comprising:

a memory cell array including a plurality of memory cells; and

a shift register which has a plurality of latch circuits connected in series and operates in a read operation to once hold data received from the memory cell array via a bit line in the latch circuits and serially outputs the held data in order in which the latch circuits are arranged, wherein

at least one of the latch circuits of the shift register sense-amplifies the data stored in the memory cells inside the memory cell array.

5,815,445

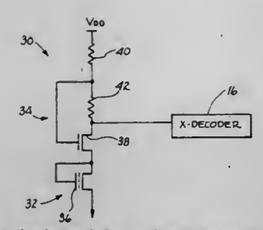
VOLTAGE REGULATOR FOR CLAMPING A ROW VOLTAGE OF A MEMORY CELL

Richard L. Hull, Chandler, and Randy L. Yach, Phoenix, both of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Filed May 30, 1997, Ser. No. 866,359
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.06 **19 Claims**

1. A voltage regulator for generating a row voltage for a memory cell of a memory array having a value which is greater than an unprogrammed threshold voltage level of said memory cell and less than a programmed threshold voltage level of said memory cell comprising, in combination:

an unprogrammed memory cell of said memory array for allowing said row voltage outputted by said voltage regulator to be self-tracking with said unprogrammed threshold voltage level of said memory cell of said memory array over manufacturing process variations and ambient environmental influences; and



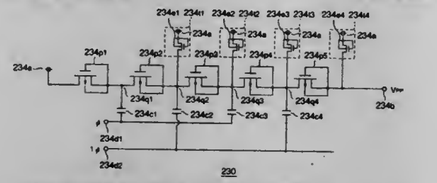
a switching circuit coupled to said unprogrammed memory cell for clamping said row voltage outputted by said voltage regulator below said programmed threshold voltage level.

5,815,446

POTENTIAL GENERATION CIRCUIT

Youichi Tobita, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1996, Ser. No. 763,120
Claims priority, application Japan, Dec. 11, 1995, 7-321760
Int. Cl.[6] G11C *11/40*
U.S. Cl. 365—189.09 **8 Claims**



5. A semiconductor memory device comprising:

(a) a memory array including a plurality of memory cells arranged in rows and columns

(b) a plurality of word lines arranged corresponding to said rows and each connecting memory cells on a corresponding row;

(c) a drive signal generator for generating a drive signal, comprising at least a pair of insulated gate type field effect transistors connected in series between an output node outputting said drive signal and a reference node receiving a reference voltage, disposed in the same forward direction and each having a respective gate and a respective back gate thereof always interconnected, and a capacitor coupled between a node interconnecting said pair of field effect transistors and an input node receiving an alternating signal; and

(d) a word driver for transferring the drive signal received from said drive signal generator onto a word line arranged corresponding to an addressed row among said rows.

5,815,447

MEMORY DEVICE HAVING COMPLETE ROW REDUNDANCY

Mark R. Thomann, Boise, Id., assignor to Micron Technology, Inc.

Filed Aug. 8, 1996, Ser. No. 695,166
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—200 **13 Claims**

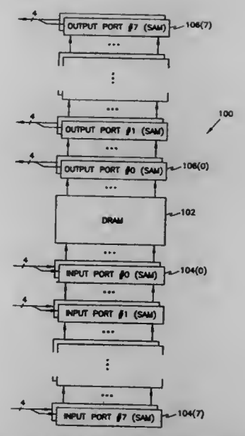
1. A multi-port memory comprising;

an input serial access memory;

an output serial access memory;

an array of primary dynamic random access memory cell capacitors arranged in X rows and Y columns, the array of primary dynamic random access memory cell capacitors is arranged in a plurality of sub-arrays;

first access devices coupled to the primary dynamic random access memory cell capacitors and first digit lines, the first



access devices selectively couple the primary dynamic random access memory cell capacitors to the first digit lines;

redundant rows of redundant dynamic random access memory cell capacitors;

second access devices coupled to the redundant dynamic random access memory cell capacitors and second digit lines, the second access devices selectively couple the redundant dynamic random access memory cell capacitors to the second digit lines;

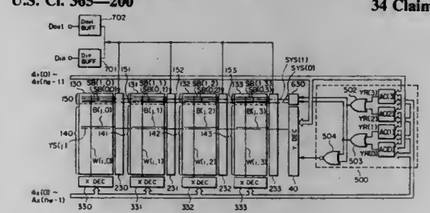
data transfer buses coupled to the input serial access memory and the output serial access memory which traverse the array and the redundant rows such that the data transfer buses intersect each primary and redundant row, the data transfer buses selectively coupled to the first and second digit lines such that the redundant rows can replace any one of the X rows of primary dynamic random access memory cell capacitors located in any one of the plurality of sub-arrays.

5,815,448

SEMICONDUCTOR MEMORY HAVING REDUNDANCY CIRCUIT

Masashi Horiguchi, Kawasaki; Jun Etoh, Hachioji; Masakazu Aoki, Tokorozawa, and Kiyoo Itoh, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 535,574, Sep. 27, 1995, Pat. No. 5,617,365, which is a continuation of Ser. No. 155,848, Nov. 23, 1993, abandoned, which is a division of Ser. No. 818,434, Dec. 27, 1991, Pat. No. 5,265,055, which is a continuation of Ser. No. 419,399, Oct. 10, 1989, abandoned. This application Mar. 31, 1997, Ser. No. 825,605
Claims priority, application Japan, Oct. 7, 1988, 63-252028; Oct. 31, 1988, 63-275375
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—200 **34 Claims**



1. A semiconductor memory comprising:

a first memory mat and a second memory mat, each memory mat having a plurality of word lines, a plurality of bit lines, a spare bit line, and a plurality of memory cells;

a plurality of bit line selection lines coupled to said first and second memory mats;

a spare bit line selection line coupled to said first and second memory mats; and

a redundancy circuit having input nodes to which a portion of an access address is supplied and an output node coupled to said spare bit line selection line,

wherein respective ones of the plurality of bit lines in said first and second mats are selected when a corresponding one of said plurality of bit line selection lines is activated,

wherein the spare bit lines in said first and second memory mats are selected when said spare bit line selection line is activated,

wherein one of the first and second memory mats is selected and one of said plurality of word lines in the selected memory mat is activated at a memory access,

wherein said redundancy circuit further includes:

a first comparing circuit having first input nodes coupled to the input nodes of said redundancy circuit, a first memory for storing a first defect information to be compared with signals supplied to the first input nodes, and a first output node coupled to the output node of said redundancy circuit; and

a second comparing circuit having second input nodes coupled to the input nodes of said redundancy circuit, a second memory for storing a second defect information to be compared with signals supplied to the second input nodes, and a second output node coupled to the output node of said redundancy circuit,

wherein the first defect information includes a first information indicating one of said plurality of bit line selection lines in which a first defect is contained and a second information indicating one of said first and second memory mats in which the first defect is contained, and

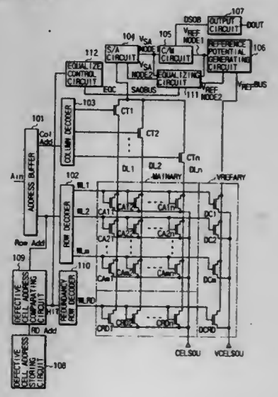
wherein the second defect information includes a third information indicating one of said plurality of bit line selection lines in which a second defect is contained and a fourth information indicating one of said first and second memory mats in which the second defect is contained.

5,815,449

SEMICONDUCTOR MEMORY DEVICE

Tadayuki Taura, Zushi, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

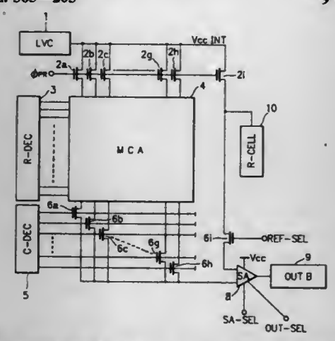
Filed Sep. 15, 1997, Ser. No. 929,574
Claims priority, application Japan, Sep. 19, 1996, 8-247397
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—200 **12 Claims**



VOL 1214 ISS 5 SEP 29 1998 UMI

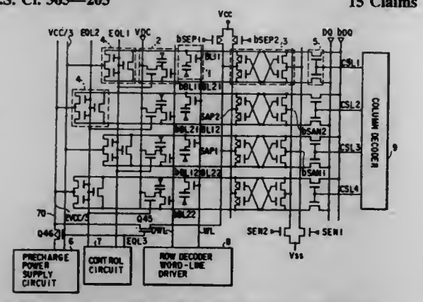
1. A semiconductor memory device, comprising:
a first memory cell array including a plurality of memory cells laid out in a matrix shape;
a second memory cell array including memory cells to be allocated to a defective memory cell when said defective memory cell exists;
an address assigning section for assigning an optional memory cell out of said first and second memory cell arrays; and
a data read-out section for comparing a potential of a read-out potential node, of which potential is determined based on a data stored in said assigned memory cell, with a potential of a reference potential node having a reference potential, and for determining a read-out data, wherein
said data read-out section short-circuits said read-out potential node with said reference potential node so that both potentials are at the same potential, when a memory cell of said second memory cell array has been assigned.

5,815,450
SEMICONDUCTOR MEMORY DEVICE
Takemi Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 15, 1996, Ser. No. 601,855
Claims priority, application Japan, Feb. 17, 1995, 7-053270
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—203 **9 Claims**



1. A semiconductor memory device having a plurality of memory cells and a plurality of bit lines, each bit line of said plurality of bit lines being connected to at least one of the plurality of memory cells, comprising:
low voltage means for receiving a power source voltage supplied from outside of said semiconductor memory device, and for producing, in response, a dropped voltage lower than said power source voltage;
precharge means connected to the low voltage means and the memory cells through the bit lines for precharging each of the plurality of bit lines concurrently with one another to the dropped voltage such that said plurality of bit lines are concurrently at said dropped voltage at a selection time;
selection means connected to the memory cells for selecting one of the memory cells at the selection time at which the plurality of bit lines are concurrently at said dropped voltage; and
a sense amplifier connected to the memory cells through the bit lines for comparing a level of the bit line of the selected memory cell with a reference level to read out data written in the selected memory cell.

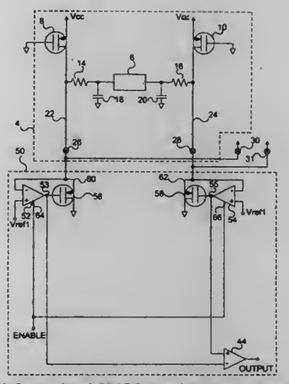
5,815,451
DYNAMIC SEMICONDUCTOR MEMORY DEVICE HAVING A PRECHARGE CIRCUIT USING LOW POWER CONSUMPTION
Kenji Tsuchida, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawaski, Japan
Filed Aug. 28, 1997, Ser. No. 919,240
Claims priority, application Japan, Nov. 19, 1996, 8-308104
Int. Cl.[6] G11C *7/00;11/24;8/00*
U.S. Cl. 365—203 **15 Claims**



1. A dynamic semiconductor memory device comprising:
a memory cell array having a plurality of dynamic memory cells disposed in a matrix configuration;
a plurality of word lines for selecting and operating said memory cells of said memory cell array;
a plurality of bit line pairs for supplying/receiving data to and from selected memory cells of said memory cell array, bit lines of said plurality of bit line pairs being divided into a first group and a second group;
bit-line sense amplifiers disposed to correspond to said bit line pairs;
a first precharge circuit disposed to correspond to said bit line pairs in said first group so as to precharge said bit line pairs in said first group to a first precharge potential between ½ of power supply voltage and ground potential;
a second precharge circuit disposed to correspond to said bit line pairs in said second group so as to precharge said bit line pairs in said second group to a second precharge potential higher than ½ of the power supply voltage by a degree which is the difference between ½ of the power supply voltage and the first precharge potential; and
a precharge control circuit for causing said first precharge circuit and said second precharge circuit to perform the corresponding precharge operations with a time difference.

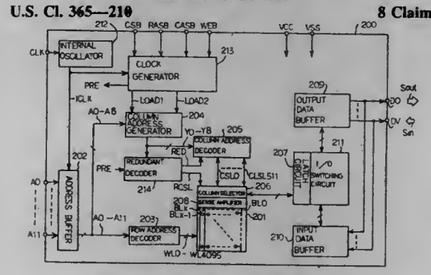
5,815,452
HIGH-SPEED ASYNCHRONOUS MEMORY WITH CURRENT-SENSING SENSE AMPLIFIERS
David H. Shen, Saratoga, Calif., assignor to Enable Semiconductor, Inc., Milpitas, Calif.
Filed Jun. 12, 1997, Ser. No. 873,326
Int. Cl.[6] G11C *7/06*
U.S. Cl. 365—207 **18 Claims**

1. A current-sensing sense amplifier for a memory device having a power supply voltage, comprising:
a bitline data input terminal, a bitline complement data input terminal, a Vref1 input terminal, a ground terminal and a memory data signal output terminal;
a first pair of PMOS transistors each having a source terminal connected to a respective one of said data input terminals, a drain terminal connected to said ground terminal, and a gate terminal;
a first pair of operational amplifiers each having an output terminal connected to the gate terminal, and an inverting input terminal connected to the source terminal, of a respective one



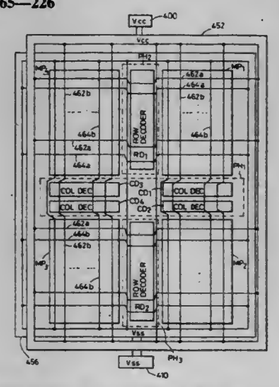
of said first pair of PMOS transistors, and a non-inverting input terminal connected to said Vref1 input terminal; and
a voltage comparator having an inverting input terminal and a non-inverting input terminal each connected to the output terminal of a respective one of said operational amplifiers, and having an output terminal connected to said memory data signal output terminal.

5,815,453
SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANT DECODER WITH SUBTANTIALLY CONSTANT MARGIN REGARDLESS OF POWER VOLTAGE LEVEL
Yoshinori Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Aug. 8, 1997, Ser. No. 908,709
Claims priority, application Japan, Aug. 9, 1996, 8-227777
Int. Cl.[6] G11C *7/02*
U.S. Cl. 365—210 **8 Claims**



1. A semiconductor memory device comprising:
a memory cell array having at least one redundant memory cell group and a plurality of memory cell groups each replaceable with said at least one redundant memory cell group;
a data interface for communicating with an external device;
an addressing means responsive to address signals representative of a first address for selectively connecting said plurality of memory cell groups and said redundant memory cell group to said data interface; and
redundant decoder including
a memory circuit for storing a second address assigned to one of said plurality of memory cell groups replaced with said at least one redundant memory cell group,
a comparator comparing said second address with said first address to see whether or not said address signals indicate the first address assigned to said one of said plurality of memory cell groups replaced with said at least one redundant memory cell group, said comparator providing a predetermined level to an output node thereof when said second address is matched with said first address,
a charging circuit connected to a power potential line,
a discharging circuit connected to a constant potential line,
a current mirror circuit connected between said charging circuit and said discharging circuit and having a control node connected to said output node of said comparator for changing a potential level at an output node of said current mirror circuit, and
a control signal generating circuit responsive to said potential level at said output node of said current mirror circuit so as to produce control signals supplied to said addressing means, said control signals causing said addressing means to connect said redundant memory cell group instead of said one of said plurality of memory cell groups to said data interface.

5,815,454
SEMICONDUCTOR MEMORY DEVICE HAVING POWER LINE ARRANGED IN A MESHED SHAPE
Shigeki Tomishima; Mikio Asakura; Kazutami Arimoto, and Hideto Hidaka, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 616,417, Mar. 15, 1996, abandoned, which is a division of Ser. No. 417,527, Apr. 6, 1995, Pat. No. 5,602,793, which is a division of Ser. No. 224,461, Apr. 7, 1994, Pat. No. 5,426,615, which is a division of Ser. No. 942,320, Sep. 10, 1992, Pat. No. 5,325,336. This application Apr. 9, 1997, Ser. No. 831,788
Int. Cl.[6] G11C *5/00*
U.S. Cl. 365—226 **29 Claims**



1. A semiconductor memory device including:
a memory plane including a memory block having a plurality of dynamic-type memory cells arranged in a matrix of rows and columns;
a first logic circuit arranged along a first direction from said memory plane;
a second logic circuit arranged along a second direction from said memory plane;
a first power supply line extending over said memory block and said first logic circuit along said first direction; and
a second power supply line extending over said memory block and said second logic circuit along said second direction.

VOL 1214 ISS 5 SEP 29 1998 UMI

5,815,455

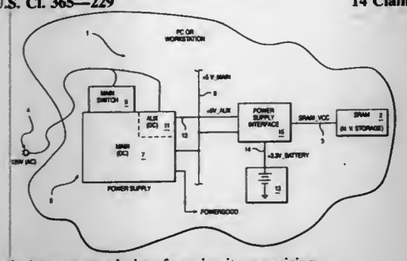
POWER SUPPLY INTERFACE CIRCUIT PROVIDING NONVOLATILE STORAGE WITH SUITABLE OPERATING AND STANDBY VOLTAGE LEVELS

Keith Andre Braithwaite; Gary Dale Carpenter, both of Pflugerville; Binh Thai Hoang, Round Rock; Cuong Thanh Nguyen, Austin; Howard Carl Tanner, Austin, and Gary Yuh Tsao, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1997, Ser. No. 933,701

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—229 **14 Claims**



1. A power supply interface circuit, comprising:

a first input line connected to a battery of first voltage;

a second input line connected to an auxiliary supply of second voltage, the second voltage being greater than the first voltage;

a third input line connected to a main power supply of third voltage, the third voltage being nominally equal to or greater than the second voltage;

an output line connected to a nonvolatile storage device;

diode interfaces between the output line and the first input line and the second input line; and

a field effect transistor operable to selectively connect the output line to the third input line responsive to a main power supply power good signal.

5,815,456

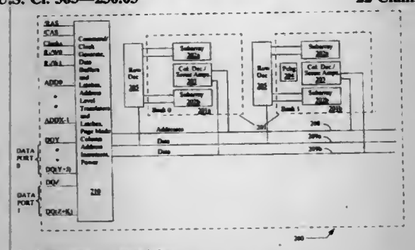
MULTIBANK — MULTIPORT MEMORIES AND SYSTEMS AND METHODS USING THE SAME

G.R. Mohan Rao, Dallas, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Jun. 19, 1996, Ser. No. 666,814

Int. Cl.[6] G11C *8/00;7/00*

U.S. Cl. 365—230.03 **22 Claims**



1. A memory comprising:

a first memory bank; a second memory bank; and

a plurality of data input/output terminals, a first subset of said plurality of data input/output terminals for accessing said first memory bank and a second subset of said plurality of data input/output terminals for accessing said second memory bank; and

inputs for receiving first and second read-write control signals, said first read-write control signal controlling accesses to said first memory bank, and said second read-write control signal controlling accesses to said second memory bank.

5,815,457

BIT LINE SELECTION DECODER FOR AN ELECTRONIC MEMORY

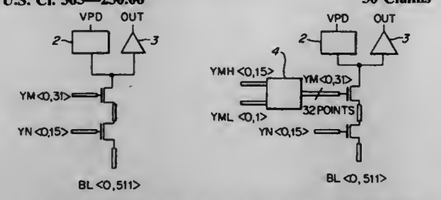
Luigi Pascucci, Sesto San Giovanni, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jun. 6, 1996, Ser. No. 659,665

Claims priority, application European Pat. Off., Jun. 26, 1995, 95830267

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.06 **30 Claims**



1. A bit line selection decoder for an electronic memory having a plurality of bit lines in a plurality of groups, comprising:

for each group of bit lines, a first set of a plurality of switches, each switch for selecting one of the plurality of bit lines in the group in response to a control signal from a first set of control lines applied to each of the groups of bit lines;

a second set of a plurality of switches, each switch for selecting one of the groups of the plurality of bit lines; and

a decoder having a first input bus of control lines and a second input bus of control lines and having a plurality of outputs, each output for driving one switch in the second set of switches, wherein a product of a number of control lines of the first input bus and a number of control lines of the second input bus is equal to a number of the outputs of the decoder.

5,815,458

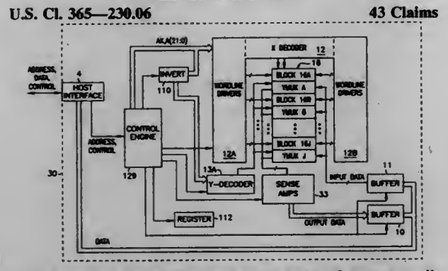
SYSTEM AND METHOD FOR WRITING DATA TO MEMORY CELLS SO AS TO ENABLE FASTER READS OF THE DATA USING DUAL WORDLINE DRIVERS

Christophe J. Chevallier, Palo Alto; Vinod C. Lakhani, Milpitas; Robert D. Norman, San Jose, and Darrell D. Rinerson, Cupertino, all of Calif., assignors to Micron Technology, Inc., Santa Clara, Calif.

Filed Sep. 6, 1996, Ser. No. 709,555

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—230.06 **43 Claims**



1. A method for writing data to an array of memory cells connected along wordlines and bitlines, wherein one of the wordlines is driven by a first wordline driver positioned along a first side of the array, one other of the wordlines is driven by a second wordline driver positioned along a second side of the array, one row of the cells is connected along said one of the wordlines, and one other row of the cells is connected along said one other of the wordlines, the method including the steps of:

(a) generating scrambled bitline addresses for a set of the data to be written to said one other row of the cells;

(b) writing the set to said one other row using the scrambled bitline addresses, wherein the scrambled bitline addresses are such that less time is needed to read a subset of the set from said one other row than would be required to read said subset if the set were written to said one other row using unmodified bitline addresses; and

(c) writing one other set of the data to said one row using said unmodified bitline addresses.

5,815,459

ADDRESS DECODING . . . SEMICONDUCTOR MEMORY

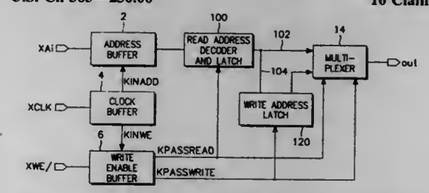
Hee-Choul Park, and Kook-Hwan Kwon, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics, Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 27, 1996, Ser. No. 758,645

Claims priority, application Rep. of Korea, Nov. 28, 1995, 1995/44241

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.06 **10 Claims**



6. Address decoding apparatus for use in a semiconductor memory comprising:

an address buffer for receiving an address for accessing the memory;

a read decoder and latch circuit coupled to receive the address from the address buffer;

a write address latch circuit coupled to receive the address from the read decoder; and

a selecting means for selecting address information from one of the read decoder latch circuit or the write address latch circuit.

5,815,460

MEMORY CIRCUIT SEQUENTIALLY ACCESSIBLE BY ARBITRARY ADDRESS

Hiroshi Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

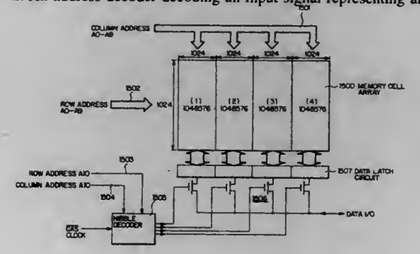
Continuation of Ser. No. 495,019, Jun. 27, 1995, abandoned. This application Dec. 18, 1996, Ser. No. 769,181

Claims priority, application Japan, Jun. 28, 1994, 5-146349

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.06 **6 Claims**

2. An address decoder decoding an input signal representing an address of a memory cell array, and producing a decoded signal representing a plurality of addresses of said memory cell array, said decoded signal being based on a burst length, said address decoder comprising:



an address latch circuit latching said input signal and producing an intermediate signal,

a decode circuit decoding said intermediate signal and producing said decoded signal, and

a selection circuit outputting a first selection signal and a second selection signal in sequence;

wherein said selection circuit outputs at least one lower-digit bit of said input signal as said first selection signal, and changes a content of said at least one lower-digit bit of said input signal in response to said burst length to produce said second selection signal; and

wherein said first selection signal selects one of said plurality of addresses of said memory cell array and said second selection signal selects another of said plurality of addresses of said memory cell array.

5,815,461

Patent Not Issued For This Number

5,815,462

SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE AND SYNCHRONOUS MEMORY MODULE

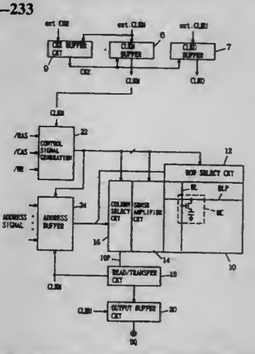
Yasuhiro Konishi; Hisashi Iwamoto; Takashi Araki; Yasumitsu Murai, and Seiji Sawada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan

Filed Feb. 12, 1997, Ser. No. 800,905

Claims priority, application Japan, Jun. 27, 1996, 8-167348

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233 **20 Claims**



1. A synchronous semiconductor memory device comprising:

a first node receiving an externally applied first clock signal applied repetitively;

a first clock buffer for receiving the first clock signal to generate a first internal clock signal corresponding to the first clock signal;

input buffer means receiving an externally applied control signal and address signal in synchronization with said first internal clock signal applied from said first clock buffer to produce an internal control signal and an internal address signal for selecting a memory cell in a memory cell array including a plurality of memory cells;

a second node receiving an externally applied second clock signal, separate from said first clock signal and repetitively applied in parallel with said first clock signal;

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a second clock buffer for receiving the second clock signal to produce a second internal clock signal corresponding to the second clock signal; and

output buffer means receiving and buffering internal read data read from the selected memory cell to produce and output external read data to an output node in synchronization with said second internal clock signal applied from the second clock buffer.

5,815,463

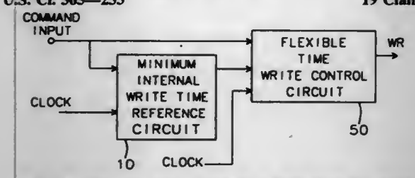
FLEXIBLE TIME WRITE OPERATION

Jeng-Tzong Shih, Hsinchu; Chun Shiah, Taichung, and Tah-Kang Joseph Ting, Hsinchu, all of Taiwan, assignors to Etron Technology, Inc, Hsin-Chu, Taiwan

Filed Jun. 12, 1997, Ser. No. 873,834

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—233 **19 Claims**



10. A flexible time write circuit in a semiconductor memory, comprising:

a minimum internal write time reference circuit receiving a write command and producing a write end pulse, after a delay of time T_W, said delay T_W representing a minimum write time for a write operation;

a flexible time write control circuit receiving a clock signal, said write command, and said write end pulse, said control circuit producing a write signal as an output at a rising edge of a first clock cycle, said control circuit terminating said write signal when said write end pulse is received by said write control circuit at a falling edge of said first clock cycle or a subsequent clock cycle.

5,815,464

ADDRESS TRANSITION DETECTION CIRCUIT

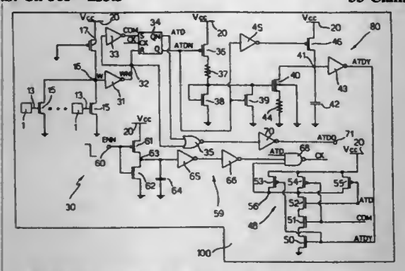
Carla Maria Golla, Sesto San Giovanni; Matteo Zammattio, Milan, and Stefano Zanardi, Seriate, all of Italy, assignors to SGS-Italy Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 5, 1997, Ser. No. 811,869

Claims priority, application European Pat. Off., Mar. 6, 1996, 96830096

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—233.5 **33 Claims**



1. An address transition detection circuit comprising:

a plurality of cells each having an input to receive a respective address signal and an output that provides a first pulse signal, each of the plurality of cells being constructed and arranged to detect transitions of its respective address signal and to generate the first pulse signal upon the detection of a transition of its respective address signal; and

a source stage having an input coupled to the output of each of the plurality of cells to receive the first pulse signal, the source stage being constructed and arranged to generate an address transition signal having first and second switching edges upon receipt of the first pulse signal, wherein the source stage includes a monostable stage having an input coupled to the output of each of the plurality of cells, the monostable stage being constructed and arranged to generate said second switching edge of said address transition signal a predetermined time period after generation of said first switching edge of said address transition signal, wherein the source stage includes a synchronous memory element having a clock enable input.

5,815,465

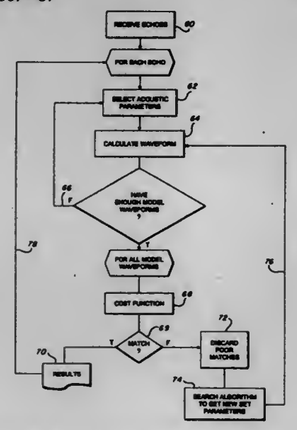
METHOD AND APPARATUS OF CLASSIFYING MARINE SEDIMENT

Altan Turgut, 3108 White Daisy Pl., Fairfax, Va. 22031

Filed Apr. 11, 1997, Ser. No. 835,970

Int. Cl.[6] G01V *1/38*

U.S. Cl. 367—87 **5 Claims**



1. A method of characterizing marine sediments, comprising:

generating an acoustic pulse;

detecting an echo of said pulse;

making a determination of whether said echo is from an interface constituted of water-sediment, or constituted of sediment-sediment;

responsive to said determination, choosing the Biot equation pertaining to said interface;

selecting values of the parameter matrix of said Biot's equation;

calculating a model waveform corresponding to said values of said parameter matrix;

applying a preselected cost function to said echo and said model waveform;

determining whether the magnitude of said cost function is below a preselected threshold; and

if said cost function is not below said preselected threshold, repeating said selecting, calculating, applying, and determining until said magnitude of said cost function is below said threshold.

5,815,466

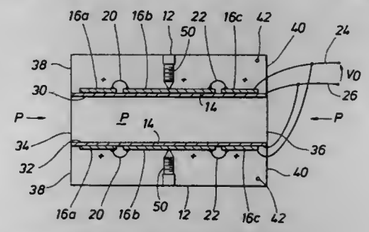
HYDROPHONE STRUCTURE WITH REVERSE BEND OF PIEZOELECTRIC ELEMENT

Louis W. Erath, Abbeville, La., assignor to Syntron, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 579,327, Dec. 27, 1995, Pat. No. 5,677,894. This application Mar. 3, 1997, Ser. No. 811,103

Int. Cl.[6] H04K *17/00*

U.S. Cl. 367—160 **14 Claims**



1. A hydrophone transducer element comprising:

a. a piezoelectric crystal defining first and second end portions and a center portion;

b. a first support structure including an enclosure and further including a wall on which the crystal is mounted, the wall defining first and second ends, the first and second ends being rigidly mounted to the enclosure; and

c. a second support structure adjacent the center portion of the crystal to constrain the bending movement of the center portion of the crystal.

5,815,467

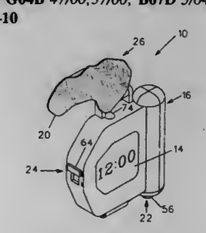
SECURITY WATCH

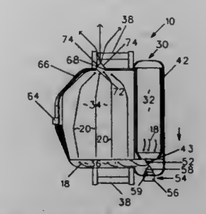
Jay A. Deering, 7840 Big River Dr., Reno, Nev. 89506

Filed Aug. 6, 1996, Ser. No. 689,293

Int. Cl.[6] G04B *47/00;37/00;* **B67D** *5/64;* **B67B** *7/28*

U.S. Cl. 368—10 **23 Claims**





1. A security device, comprising:

a securing means for attaching said device to a user;

a housing on said securing means having a sealed first chamber for storing a pressurized gas and a second chamber for storing a sprayable substance and a passageway extending between said chambers;

arming means adjacent said first chamber for unsealing said first chamber to allow said pressurized gas to travel from said first chamber through said passageway and into said second chamber for commingling with said sprayable substance; and

user-operable discharge means attached to said housing for discharging said substance and gas from a port in said second chamber, including a user operable closure element movable between open and closed positions over said port.

5,815,468

DUAL PLAYER AUTOMOTIVE AUDIO SYSTEM CAPABLE OF PLAYING BACK TWO DIFFERENT TYPES OF RECORDING MEDIUMS

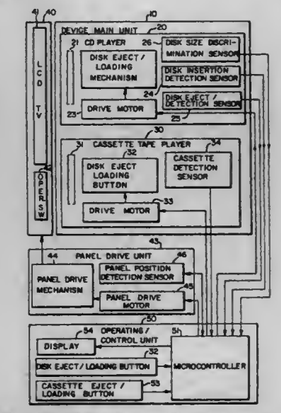
Hidenori Muramatsu; Hiroyuki Umezawa; Mitsuharu Nakai, and Akira Kojima, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Toda, Japan

Filed Mar. 12, 1997, Ser. No. 816,190

Claims priority, application Japan, Mar. 12, 1996, 8-055158

Int. Cl.[6] H04B *1/20*

U.S. Cl. 369—2 **14 Claims**



1. An audio player for an automobile comprising:

a housing member;

a first player unit mounted in the housing member for playing a first audio recording media, the first player unit has a first insertion slot on one side of the housing member for insertion and extraction of a first audio recording media;

a second player unit mounted in the housing media, adjacent the first player unit, for playing a second audio recording media of a different size from the first audio recording media, the second player unit has a second insertion slot on the same side of the housing member as the first insertion slot;

a movable operating panel for controlling the respective first player unit and second player unit to extend across the first and second insertion slots;

a panel drive motor and linkage assembly is connected to the operating panel for moving the operating panel relative to the housing member and includes a slide member pivotally connected to the movable operating panel and a guide slot and guide pin operatively connected between the operating panel and the housing member, the slide member is driven to reciprocate in a linear direction into and out of the housing member to move the operating panel, wherein an initial movement of the slide member out of the housing member rotates and tilts the operating panel towards the housing member to expose the first insertion slot, while a retraction movement of the slide member rotates the operating panel about the guide pin and causes the slide member to be retracted within the housing member; and

a control unit for driving the panel drive motor in a first mode of operation to move the operating panel to expose only the first insertion slot and a second mode of operation to further move

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the operating panel to expose both the first insertion slot and the second insertion slot, while retracting at least a portion of the operating panel into the housing member below the second insertion slot.

5,815,469

MAGNETO-OPTICAL RECORDING DEVICE HAVING RECORDING MAGNETIC FIELD IN THE SAME DIRECTION AS REPRODUCING MAGNETIC FIELD

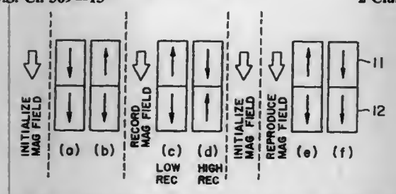
Satoshi Shimokawato; Hiromu Miyazawa, and Toshiaki Mikoshiba, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-To, Japan

Division of Ser. No. 339,510, Nov. 14, 1994, Pat. No. 5,574,703, which is a continuation-in-part of Ser. No. 717,672, Jun. 19, 1991, abandoned. This application Aug. 29, 1996, Ser. No. 705,284

Claims priority, application Japan, Jun. 21, 1990, 2-163510; May 20, 1991, 3-114919

Int. Cl.[6] G11B *11/00*

U.S. Cl. 369—13 **2 Claims**



1. A method of recording and reproducing data recorded in a magneto-optical recording medium formed by laminating a first magnetic layer having a relatively high coercive force at room temperature and a relatively low Curie point and a second magnetic layer having a relatively low coercive force at room temperature and a relatively high Curie point so that these magnetic layers are exchange coupled to each other, the data being recorded as magnetization directions of the first magnetic layer on the recording medium, the method comprising the steps of:

(a) irradiating a laser beam upon the recording medium and applying a recording magnetic field thereto so as to record the data;

(b) applying a reproducing magnetic field of the same direction as the recording magnetic field to an area on the recording medium at which the data are recorded; and

(c) irradiating a laser beam upon the data recorded area simultaneously when the reproducing magnetic field is applied under a condition that directions of magnetization of the second magnetic layer are aligned in a direction so as to reproduce the recorded data.

5,815,470

DISC DRIVE UNIT

Kiyoshi Ohmori; Sunao Aoki, both of Kanagawa; Takeshi Funahashi, Saitama, and Yoshikatsu Niwa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 512,889, Aug. 9, 1995. This application Apr. 10, 1997, Ser. No. 843,649

Claims priority, application Japan, Aug. 11, 1994, 6-189185

Int. Cl.[6] G11B *17/04;5/012;33/02*

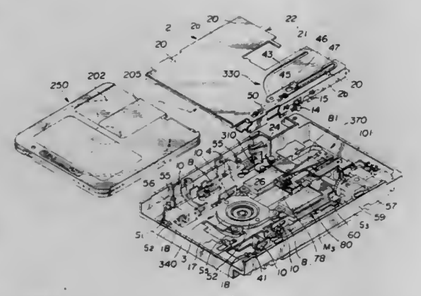
U.S. Cl. 369—13 **2 Claims**

1. A disc driving apparatus for driving a magneto-optical disc recording medium accommodated in a disc cassette, said apparatus comprising:

a magnetic head for applying a magnetic field to a magneto-optical disc;

a magnetic-head moving mechanism for moving said magnetic head between a loading position and an unloading position;

an eject mechanism for ejecting said disc cassette;



a motor;

transmission means for transmitting a rotational force of said motor to said magnetic-head moving mechanism by rotation of said motor in its one rotational direction, and for transmitting the rotational force of said motor to said eject mechanism by rotation of said motor in its other rotational direction; and

control means for controlling said motor so that a rotational speed of said motor in said other rotational direction is faster than a rotational speed of said motor in said one rotational direction.

5,815,471

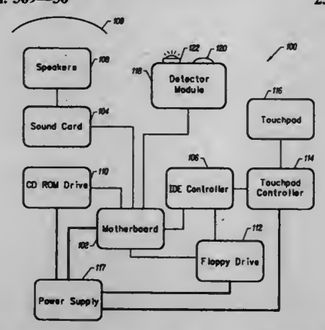
METHOD AND APPARATUS FOR PREVIEWING AUDIO SELECTIONS

William L. Mince, Menlo Park, and Daniel E. Kyte, San Francisco, both of Calif., assignors to PICS Previews Inc., San Francisco, Calif.

Filed Aug. 8, 1996, Ser. No. 694,694

Int. Cl.[6] G11B *17/22*

U.S. Cl. 369—30 **25 Claims**



1. An apparatus for previewing a plurality of audio selections, comprising:

a memory drive for reading a first digital storage medium having the plurality of audio selections stored therein in a spiral track with open indexing, the spiral track with open indexing comprising a plurality of indexed tracks, the open indexing allowing accessing of sub-tracks within the indexed tracks;

a touchpad for selecting one of the audio selections;

sound circuitry for converting the audio selections to audio signals;

at least one audio speaker coupled to the sound circuitry for converting the audio signals to acoustic energy;

a controller coupled to and controlling the operation of the memory drive, the touchpad, and the sound circuitry.

5,815,472

INFORMATION RECORDING METHOD AND APPARATUS

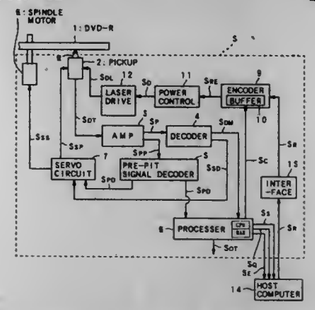
Kazuo Kuroda, and Toshiro Tanikawa, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 20, 1997, Ser. No. 915,649

Claims priority, application Japan, Aug. 22, 1996, 8-221587

Int. Cl.[6] G11B *17/22;7/00*

U.S. Cl. 369—32 **14 Claims**



1. An information recording method comprising:

a buffering process for temporarily storing information, which is inputted from the external and is to be recorded, in a buffer memory;

a generating process for reading out the temporarily stored information from said buffer memory, and applying a predetermined signal process onto the read out information to generate processed information comprising a plurality of record units;

a recording process of recording the processed information onto an information record medium;

a detecting process of detecting a storage amount of the temporarily stored information in said buffer memory;

a stop controlling process of controlling said recording process to stop recording the processed information within a presently-recorded record unit among the record units, which includes the processed information which is being recorded by said recording process, when the detected storage amount becomes less than a predetermined value; and

a re-start controlling process of controlling said recording process to re-start recording the processed information onto said information record medium from one of the record units, which includes the processed information to be recorded prior in time sequence to said presently-recorded record unit, or which is identical with said presently-recorded record unit, when the detected storage amount becomes more than the predetermined value.

5,815,473

OPTICAL PICKUP DEVICE FOR DETECTING TRACKING ERROR OF OPTICAL DISKS WITH DIFFERENT TRACK PITCHES

Yoshitaka Takahashi, and Masami Emoto, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1996, Ser. No. 628,777

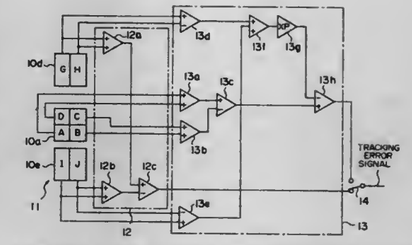
Claims priority, application Japan, Apr. 11, 1995, 7-084398; Jul. 28, 1995, 7-192919

Int. Cl.[6] G11B *7/09*

U.S. Cl. 369—44.26 **9 Claims**

1. An optical pickup device for accessing an optical disk, comprising:

an optical system forming a main spot and a set of sub-spots on the optical disk by a beam of light processed by said optical system;



a photodetector unit, associated with said optical system, outputting first signals in response to a reflection beam from the main spot, and outputting second signals in response to reflection beams from the sub-spots;

a tracking error detector including a first detection circuit designed to output a first tracking error signal for a first track pitch in response to said second signals from said photodetector unit, and a second detection circuit designed to output a second tracking error signal for a second track pitch in response to said first signals and said second signals from said photodetector unit, said second track pitch being different from said first track pitch; and

a switch selectively connecting one of said first detection circuit and said second detection circuit to an output of said tracking error detector in response to a track pitch of said optical disk,

said tracking error detector outputting one of said first tracking error signal and said second tracking error signal which is appropriate for said track pitch of said optical disk,

wherein said first detection circuit outputs the first tracking error signal dT in accordance with the equation:

$$dT=(G+H)-(I+J)$$

where G, H, I and J are the second signals output from the photodetector unit, and said second detection circuit outputs said second tracking error signal dT in accordance with the equation:

$$dT=(A+D)-(B+C)-P\{(G-H)+(I-J)\}$$

where A, B, C and D are the first signals output from the photodetector unit, G, H, I and J are the second signals output from the photodetector unit, and P is a predetermined coefficient.

5,815,474

METHODS AND APPARATUS FOR SELECTIVELY INHIBITING REPRODUCTION OF RECORDED SETS OF DATA

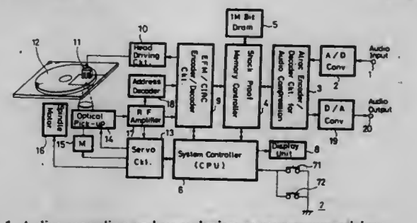
Teppei Yokota, Chiba, Japan, assignor to Sony Corporation, Japan

Filed Mar. 16, 1993, Ser. No. 33,181

Claims priority, application Japan, Mar. 23, 1992, 4-065106

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—47 **8 Claims**



1. A disc recording and reproducing apparatus comprising:

means for receiving independent sets of data to be recorded;

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means for encoding each set of data for recording onto a disc, the disc having a lead-in section for recording thereon of recording state information regarding each set of data and a recording area for recording thereon of each encoded set of data;

a magnetic head for recording onto the recording area of the disc each encoded set of data and for recording onto the lead-in section of the disc recording state information regarding each set of data, the recording state information including reproduction information indicating whether to inhibit reproduction of any recorded encoded set of data; and

controller means for selectively masking an unnecessary recorded encoded set of data by changing the reproduction information to indicate inhibition of reproduction of such set of recorded encoded data while retaining the information indicating the order of recording, and for selectively cancelling the masking of a masked recorded encoded set of data by changing the reproduction information to indicate non-inhibition of reproduction of such set of recorded encoded data while retaining the information indicating the order of recording.

5,815,475

RECORDING MEDIUM MANAGEMENT METHOD WHERE RECORDING IS CARRIED OUT BY DATA RECORDING UNITS IN ACCORDANCE WITH MANAGEMENT TABLES

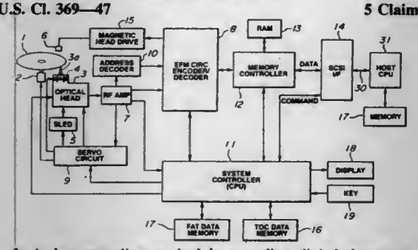
Tatsuya Igarashi, Kanagawa, and Katsuyuki Teranishi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 374,727, Mar. 20, 1995. This application May 12, 1997, Ser. No. 854,689

Claims priority, application Japan, Jun. 14, 1993, P5-141819; Oct. 28, 1993, P270099

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—47 **5 Claims**



1. A data recording method in recording digital data onto a recording medium,

the method comprising the steps of:

reading out digital data of first data recording units caused to undergo management by a first table from the recording medium;

storing the digital data of the first data recording units into a memory;

updating at least one portion of the digital data of the first data recording units stored in the memory by new digital data every second data recording unit less than the first data recording unit, which is caused to undergo management by a second table; and

recording new digital data of the first data recording units including the new digital data stored in the memory onto the recording medium,

wherein when in an area where recording is carried out by the first data recording units an unrecorded area is insufficient, an area where recording is carried out by the second data recording units is changed to an area on the first table, and wherein when in the area where recording is carried out by the second data recording units an unrecorded area is insufficient, an area where recording is carried out by the first data recording units is changed to an area on the second table.

5,815,476

DISC DATA REPRODUCING APPARATUS AND SIGNAL PROCESSING CIRCUIT

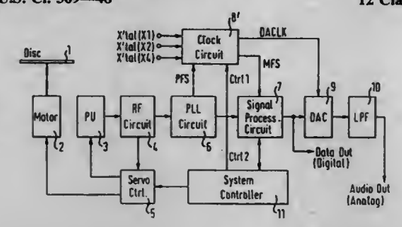
Jun Inagawa; Yasuhiro Hayashi, and Makoto Kubo, all of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 450,657, May 25, 1995, Pat. No. 5,729,515. This application Oct. 27, 1997, Ser. No. 957,921

Claims priority, application Japan, May 26, 1994, 6-136451; Jul. 7, 1994, 6-177753

Int. Cl.[6] G11B *20/10*

U.S. Cl. 369—48 **12 Claims**



1. An apparatus for reproducing disc data capable of being classified into at least a first type data and a second type data, the apparatus comprising:

a disc motor to rotate a disc storing the disc data;

an optical pickup to read the disc data to be reproduced from the disc;

a demodulation circuit to demodulate the disc data read from the disc;

a buffer memory to store the demodulated data; and

a digital-to-analog converter to convert the demodulated data of the first type data read from the buffer memory in response to a reference clock signal;

wherein, when the disc data to be reproduced is the first type data, a frequency of the reference clock signal is set to a first value, and when the disc data to be reproduced is the second type data, the frequency of the reference clock signal is set to a second value lower than the first value so as to reduce power consumption of the digital-to-analog converter.

5,815,477

WRITE TEST METHOD FOR USE IN RECORDING PROCESS FOR RECORDING INFORMATION BY MODULATING THE POWER OF A LASER LIGHT THEREBY FORMING A HIGH-TEMPERATURE STATE AND A LOW-TEMPERATURE STATE ON A RECORDING MEDIUM

Shunpei Kimura; Takaaki Ashinuma, both of Yokohama; Tsutomu Shiratori, Tokyo, and Akira Miyashita, Tokorozawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 594,300

Claims priority, application Japan, Jan. 31, 1995, 7-014099; Jul. 19, 1995, 7-182613; Jul. 19, 1995, 7-182614

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—50 **6 Claims**

1. A write test method for use in a recording process for recording information by modulating the power of a laser light thereby forming a high-temperature state and a low-temperature state on a recording medium, comprising:

a step of recording a predetermined signal on the medium;

a first step of reproducing the recorded information;

steps of repeating the recording step with a variation in the power level of the laser light and repeating said first reproducing step;

a step of detecting the power level of the laser light which occurs immediately before the formation of the high-temperature state, based on amplitudes of reproduced signals obtained in said first reproducing step; and

a step of determining the power level of the laser light for forming the low-temperature state and the power level of the laser light for forming the high-temperature state, based on the detected power level,

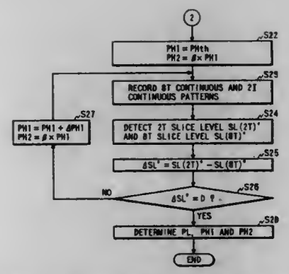
wherein said determining step includes:

a step of recording record marks of different sizes on the medium, with a variation of the power level of the laser light, taking the detected power level as a reference;

a second step of reproducing the recorded information; and

a step of detecting middle values of the peak and bottom values of the reproduced signals, obtained in said second reproducing step and corresponding to the record marks, and detecting the difference between the middle values,

wherein the power level of said laser light for forming the high-temperature state is determined according to said difference.



5,815,478

METHOD OF DRIVING A CD-ROM DRIVE

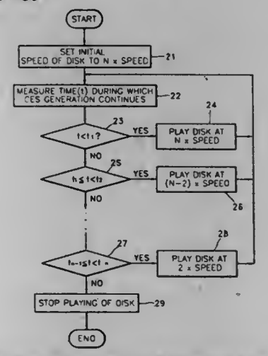
Hong-jang Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Apr. 21, 1997, Ser. No. 844,655

Claims priority, application Rep. of Korea, May 14, 1996, 1996 15981

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—50 **17 Claims**



1. A method of driving a CD-ROM drive for playing a disk, comprising the steps of:

(a) setting an initial driving speed of the disk to N× speed, where N=2n and n is a positive integer;

(b) measuring a length of time t required to generate a correction error signal (CES) of a digital signal processor (DSP) while playing the disk at N× speed;

(c) determining whether the measured CES generation time t is smaller than a first reference time t_1;

(d) playing the disk at N× speed if it is determined in step (c) that the CES generation time t is smaller than the first reference time t_1;

(e) determining whether the CES generation time t is equal to or greater than the first reference time t_1 and smaller than a second reference time t_2 if it is determined in step (c) that the CES generation time t is equal to or greater than the first reference time t_1;

(f) determining whether the CES generation time t is equal to or greater than an (n-1)th reference time t_i and smaller than an nth reference time t_n after an algorithm is sequentially repeated for all reference times between t_1 and t_n;

(g) playing the disk at 2× speed if it is determined in step (f) that the CES generation time t is equal to or greater than the (n-1)th reference time t_{n-1} and smaller than the nth reference time t_n; and

(h) stopping the playing of the disk if it is determined in step (f) that the CES generation time t is equal to or greater than the nth reference time t_n.

5,815,479

DOOR ASSEMBLY FOR OPTICAL DRIVER

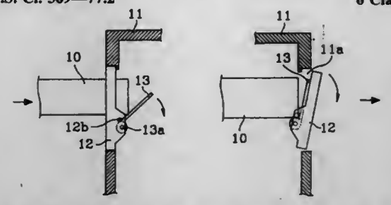
Young-Pyo Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Sep. 19, 1996, Ser. No. 715,876

Claims priority, application Rep. of Korea, Nov. 20, 1995, 42263/1995

Int. Cl.[6] G11B *33/02*

U.S. Cl. 369—77.2 **6 Claims**



1. A door assembly of an optical driver, the optical driver including a front cover having an opening therein, and a caddy for holding one of a cartridge, a tape, a cassette tape, and a disk, said door assembly comprising:

a first door hingedly mounted on the front cover of the optical driver so as to openably close the opening, said first door being opened only in a direction in which the caddy is ejected, said first door having an insertion hole formed therein for inserting the caddy; and

a second door hingedly mounted on an interior of said first door so as to openably close said insertion hole, said second door being opened in an inward direction within the optical driver only when the caddy is inserted,

wherein said second door and said first door are automatically opened and closed according to insertion and ejection, respectively, of the caddy, thereby to prevent an influx of dust and other impurities through the opening and into the optical driver.

5,815,480

METHOD FOR CALCULATING AND RECORDING A START PROGRAM RADIUS UPON A COMPACT DISC

Robert Seidel, West Pittston, Pa., assignor to WEA Manufacturing, Inc., Olyphant, Pa.

Filed Sep. 5, 1996, Ser. No. 708,738

Int. Cl.[6] G11B *3/90*

U.S. Cl. 369—84 **3 Claims**

1. A process for providing a compact disc accurately encoding the Start Program Point for a compact disc recording of data first

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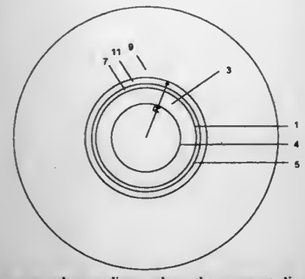


recorded on an other medium, where the compact disc recording format has a known pit/land pattern designating silence, a known scanning velocity (SV) and track pitch (TP), comprising the steps of:

(a) measuring with the aid of a microscope the radius R of the transition visible through said microscope of the first pit/land transition from silence to data,

(b) measuring with the aid of an editor for the other medium a delay period, AT, of silence intended to be part of the data,

(c) calculating the Start Program Point,

(d) recording the Start Program Point thus calculated among the data represented on the compact disc as pits and lands.

5,815,481

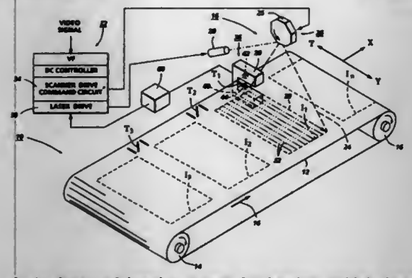
APPARATUS FOR TRANSVERSE IMAGE REGISTRATION OF A PHOTORECEPTOR BELT

Ssujan Hou, Webster, and Lam F. Wong, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 859,746, Mar. 30, 1992, abandoned. This application Jan. 24, 1994, Ser. No. 185,294

Int. Cl.[6] G11B *3/74*

U.S. Cl. 369—97 **4 Claims**



1. An improved imaging system for forming multiple image exposure frames on a photoconductive member including:

a photoreceptor belt adapted to accommodate the formation of an integral number of image exposure frames, said belt having a plurality of target apertures formed outside of the exposure area and associated with each exposure frame respectively,

detecting means associated with said target apertures for detecting changes in the lateral position of each aperture, the apertures in said belt moving through a process direction, and

means for generating signals for adjusting the transverse location of said exposure frames in relation to the detected lateral position of said apertures wherein the improved apertures comprise a set of three inclined slots, each slot alternately and differently inclined with respect to each other at an angle θ which is greater than 0° with respect to a transverse line perpendicular to the process direction, each slot separated from each other by a distance S in the process direction when the belt is properly registered.

5,815,482

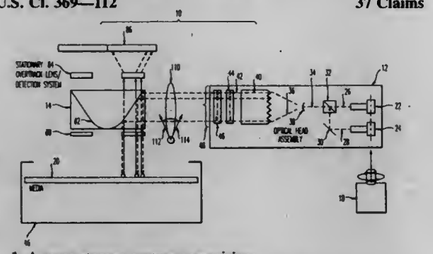
MULTIBYTE RANDOM ACCESS MASS STORAGE/ MEMORY SYSTEM

Ronald E. Rope, Denver, and Martin L. Pullam, Littleton, both of Colo., assignors to T Squared G, Inc., Denver, Colo.

Filed Jan. 22, 1996, Ser. No. 589,560

Int. Cl.[6] G11B *7/12*

U.S. Cl. 369—112 **37 Claims**



1. A mass storage system comprising:

a) a housing for securing a media in a stationary position;

b) an optical head assembly including (i) first and second light sources generating read and write beams, and (ii) a lens assembly for splitting each of the read and write beams into a plurality of parallel read and write beams;

c) a lens/detection assembly optically coupled to the optical head assembly and including (i) an angled beam splitter for directing the plurality of parallel read and write beams to the media for simultaneously reading multiple tracks of data therefrom or simultaneously writing multiple tracks of data thereto, and (ii) a diverging lens for directing a plurality of reflected read or writ beams received from the media to a photodetector; and

d) a solid state pivotal mechanism for controlling the relative movement of the optical head assembly and the lens/detection assembly.

5,815,483

OPTICAL PICKUP

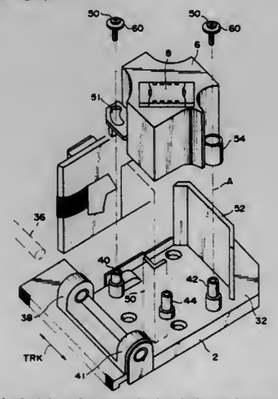
Genichi Iizuka, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 489,393, Jun. 12, 1995, Pat. No. 5,617,403. This application Mar. 24, 1997, Ser. No. 823,227

Claims priority, application Japan, Jun. 21, 1994, 6-163173

Int. Cl.[6] G11B *7/08;21/16*

U.S. Cl. 369—244 **3 Claims**



1. An optical pickup for reproducing information recorded on an information recording medium with a laser beam, comprising:

a slide member having a plurality of cylindrical bosses and being displaced between an inner peripheral portion of the information recording medium and an outer peripheral portion thereof, a first one of said plurality of cylindrical bosses being hollow so as to form a tube, each of said plurality of cylindrical bosses having a tapped hole formed therein;

a laser-beam receiving and emitting device comprising an emitting unit for irradiating the information recording medium with the laser beam and a receiving unit for receiving therein the laser beam reflected from the information recording medium;

holding means for holding said laser-beam receiving and emitting device, said holding means having a plurality of engagement portions formed therein respectively brought into engagement with said plurality of bosses, said first one of said plurality of bosses being arranged in a first one of said plurality of engagement portions relative to said laser-beam device so that the laser beam is emitted and received through the hollow boss, a second one of said plurality of engagement portions being formed as a slot receiving therein a second one of said plurality of bosses, so that said holding means is rotated with a third one of said plurality of bosses as a fulcrum;

a plurality of holding screws; and

a plurality of disk springs, each of said plurality of disk springs including a substantially flat circular area with a center hole for receiving one of said plurality of holding screws, an annular shoulder area, and an annular flange area for pressing against a surface of said holding means when one of said plurality of holding screws is threaded into the tapped hole of a respective one of said plurality of cylindrical bosses.

5,815,484

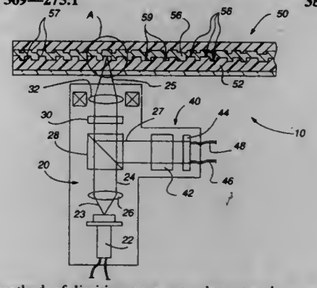
COPY PROTECTABLE OPTICAL MEDIA DEVICE AND METHODOLOGY THEREFOR

Jerry R. Smith, Littleton, Colo.; Hilary S. Lackritz, Half-Moon Bay, Calif.; Mark McLaughlin, Baton Rouge, La., and J. Bradford Merry, Annapolis, Md., assignors to Hide and Seek Technologies L.L.C., Nederland, Colo.

Filed Dec. 24, 1996, Ser. No. 780,098

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—275.1 **38 Claims**



1. A method of limiting access to data stored on an optical medium, comprising the steps of:

(a) rotating an optical disk in a disk drive at a selected rotational speed, said optical disk including an area coincident with a substrate and a metallic layer encoded with information stored thereon as a plurality of readable data structures and said area also coincident with a reactive compound superimposed over at least said data structures of said area, said reactive compound intended to be operative in an ambient environment containing oxygen for reacting with the oxygen to change an optical transmission from said area in response to irradiation for an accumulated duration of time by light having a beam wavelength within a selected range; and

(b) directing an interrogating beam of light having a beam wavelength that is within the selected range toward at least a portion of said area and through said reactive compound for the accumulated duration of time.

5,815,485

RECORDING MEDIUM, A METHOD FOR PRODUCING THE SAME, A CONTROL METHOD USING THE RECORDING MEDIUM, AND A RECORDING/ REPRODUCING APPARATUS USING THE RECORDING MEDIUM

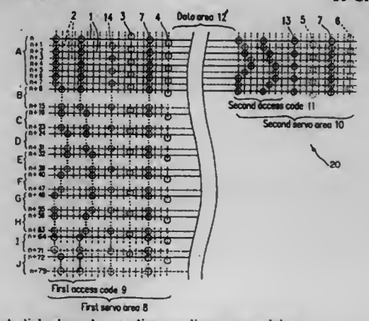
Shinichi Tanaka, Kyoto; Hiromichi Ishibashi, Ibaraki; Mitsurou Moriya, Ikoma, and Shinichi Kadowaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 189,685, Feb. 1, 1994, abandoned. This application Aug. 27, 1996, Ser. No. 703,859

Claims priority, application Japan, Feb. 2, 1993, 5-015198; Mar. 10, 1993, 5-048916

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—275.3 **10 Claims**



1. A disk-shaped recording medium, comprising:

a plurality of first tracks and a plurality of second tracks for recording data, the first tracks and the second tracks being alternately arranged in a radial direction on a surface of the recording medium in one of a pattern of concentric circles and a spiral pattern;

a plurality of first servo areas and a plurality of second servo areas discretely located at a plurality of respective specified rotation angular positions of the surface along a circumferential direction of the recording medium to be disposed alternately with each other in the circumferential direction;

a plurality of first servo marks and a plurality of second servo marks used for tracking control, each of said first and second servo marks including a pair of wobbled marks; and

a plurality of clock marks used for synchronization, the clock marks being provided at an equal rotation angular interval along each of the first and second tracks in the first and second servo areas, wherein in the first servo areas the first servo marks are provided along each of the first tracks whereas no second servo marks are provided along the second tracks; in the second servo areas the second servo marks are provided along each of the second tracks whereas no first servo marks are provided along the first tracks,

each of the paired wobbled marks is provided along the corresponding track, the paired wobbled marks being spaced each other along the corresponding track and displaced by a specific distance from the center of the corresponding track in opposite directions respectively, and

the first servo areas are isolated from the second servo areas in the circumferential direction so that the first servo marks and the second servo marks are provided in the different servo areas from each other; and

further including synchronization marks respectively provided at a plurality of specified angular positions along each of the first and the second tracks excluding the first and the second servo-

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areas, the synchronization marks having a specified pattern which is different from any pattern of data in the recording medium; and

mark rows respectively provided next to the synchronization marks along each of the first and the second tracks at a specified angular interval which is shorter than the rotation angular interval of the clock marks, and also has a relationship indicated by a ratio of integers with the rotation angular interval of the clock marks.

5,815,486

OPTICAL DISK, RECORDING/REPRODUCING APPARATUS AND METHOD FOR RAPIDLY RECORDING/REPRODUCING DATA ON/FROM AN OPTICAL DISK USING GRAY CODING

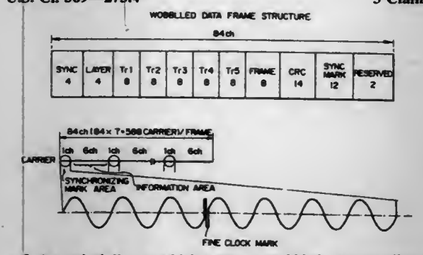
Shoei Kobayashi, Kanawaga; Toru Takeda, Saitama, and Tamotsu Yamagami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1996, Ser. No. 704,020

Claims priority, application Japan, Aug. 31, 1995, 7-223181

Int. Cl.[6] G11B *3/70;17/22*

U.S. Cl. 369—275.4 **3 Claims**



3. An optical disc on which a groove, wobbled corresponding to address information, is previously formed,

said groove being formed such that said groove is wobbled corresponding to said address information converted into a gray code, wherein the gray code always comprises a "1",

wherein a synchronizing mark area is formed in each predetermined amount of information area, in said wobbled groove, and

wherein a signal having a predetermined frequency is recorded in said synchronizing mark area, and within said synchronizing mark area a synchronizing mark is recorded at a frequency different from the predetermined frequency.

5,815,487

DISC CARTRIDGE

Hirotoshi Fujisawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 146,431, Oct. 29, 1993, Pat. No. 5,530,691, which is a continuation of Ser. No. 821,991, Jan. 16, 1992, abandoned. This application Jan. 10, 1996, Ser. No. 585,041

Claims priority, application Japan, Jan. 21, 1991, 3-019139; May 31, 1991, 3-155453

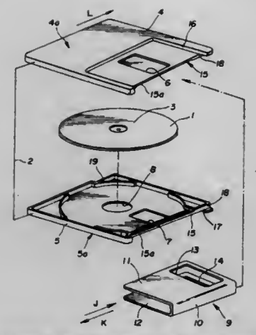
Int. Cl.[6] G11B *5/84;23/03*

U.S. Cl. 369—291 **10 Claims**

1. A disc cartridge comprising:

a cartridge body having a thickness and an aperture for exposing at least a part of a signal recording area of a disc accommodated therein;

a shutter slidably mounted on said cartridge body for opening and closing said aperture, the shutter being slidable in a recess formed in a pair of opposing, parallel, lateral faces of the cartridge body;



a shutter opening groove formed in a first lateral side of said cartridge body for extending along the sliding direction of said shutter which is parallel to the direction of insertion of the disc cartridge into a recording and/or reproducing apparatus;

a mistaken insertion inhibiting groove formed in a second lateral side of said cartridge body and extending parallel to said shutter opening groove, and said mistaken insertion inhibiting groove being shorter in length than the length of said shutter opening groove; and

wherein said shutter opening groove and the mistaken insertion inhibiting groove are both opened on a third lateral side of said cartridge body which is a leading lateral side in the direction of insertion of the disc cartridge into the recording and/or reproducing apparatus, and wherein said second lateral side of said cartridge body is located opposite to the first lateral side in which said shutter opening groove is formed, and further wherein said cartridge body has a longer lateral side extending parallel to said direction of insertion than its lateral side extending normal to said direction of insertion.

5,815,488

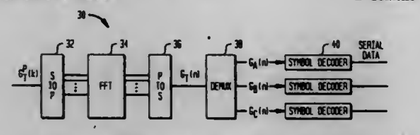
MULTIPLE USER ACCESS METHOD USING OFDM

Thomas H. Williams, Longmont, and Richard S. Prodan, Boulder, both of Colo., assignors to Cable Television Laboratories, Inc., Louisville, Colo.

Filed Sep. 28, 1995, Ser. No. 535,593

Int. Cl.[6] H04J *11/00*

U.S. Cl. 370—206 **2 Claims**



1. A method for enabling a plurality of remote locations to transmit data to a central location comprising the steps of:

at each remote location, coding data to be transmitted by translating each group of one or more bits of said data into a transform coefficient associated with a particular baseband frequency in a particular subset of orthogonal baseband frequencies allocated to the remote location, the particular subset of orthogonal baseband frequencies allocated to each remote location being chosen from a set of orthogonal baseband frequencies, the subsets of baseband frequencies allocated to each remote location being mutually exclusive.

at each remote location, using an electronic processor, performing an inverse orthogonal transformation on said transform coefficients to obtain a block of time domain data;

at each remote location, utilizing a modulator to modulate said block of time domain data onto a carrier signal for transmission to said central location, said carrier signal having the same carrier frequency for each remote location;

receiving at said central location from one or more of said remote locations, one or more blocks of time domain data modulated on one or more of said carrier signals;

using a demodulator, demodulating said one or more blocks of time domain data from the carrier frequency signal.

performing said orthogonal transformation on said demodulated time domain data to reconstruct said transform coefficients, and

translating said transform coefficients into said data to be translated from each remote location.

5,815,489

SELF-HEALING RING SWITCH AND METHOD OF CONTROLLING THE SAME

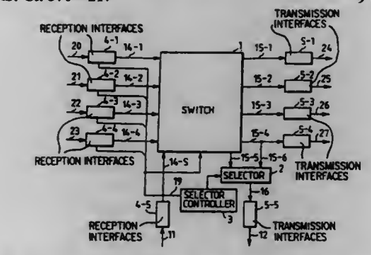
Masahiro Takatori, Hachioji; Yoshihiro Ashi, and Hiroyuki Fujita, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 356,617, Dec. 15, 1994, Pat. No. 5,600,631. This application Oct. 31, 1996, Ser. No. 741,441

Claims priority, application Japan, Jan. 11, 1994, 6-001112

Int. Cl.[6] H04Q *11/04*

U.S. Cl. 370—217 **9 Claims**



8. A processing method to be used for each of the nodes in a self-healing ring network that includes:

a self-healing ring switch having a plurality of input ports and a plurality of output ports; and

a selector having at least two input ports and one output port, two of the output ports of said self-healing ring switch being connected with the input ports of said selector,

wherein the communications between the nodes in said self-healing ring network are realized such that the nodes at the transmission side send out a transmission signal to both a clockwise line and a counter-clockwise line in said self-healing ring network, whereas the nodes at the reception side select one of the signals having arrived through said two paths, said method comprising:

a switch control method comprising the steps of:

connecting at a reception node the signal having passed through said clockwise line and the signal having passed through said counter-clockwise line with the input ports of said self-healing ring switch in said node,

outputting at said self-healing ring switch in said node the signals having passed through said clockwise line in a time-division-multiplexed form to the other output port,

outputting the signals having passed through said clockwise line and said counter-clockwise line belonging to a common channel, simultaneously to said two output ports, and

selecting one of the signals to arrive from the two output ports of said self-healing ring switch.

5,815,490

SDH RING HIGH ORDER PATH MANAGEMENT

Tsu-kai Lu, Sterling, Va., assignor to NEC America, Inc., Melville, N.Y.

Filed Nov. 20, 1995, Ser. No. 559,884

Int. Cl.[6] H04L *12/24*

U.S. Cl. 370—223 **30 Claims**

MODES/ CHANNELS	MODE A		MODE B		MODE C		MODE D	
	DROP	ADD	DROP	ADD	DROP	ADD	DROP	ADD
STM #1		AC1-1	AC1-1	AC1-0	AC1-1			
STM #2		AD2-2		AD2-0		AD2-0	AD2-1	
STM #3		AB3-3	AB3-2					
STM #4						CD6-2	CD6-2	
STM #5						CD7-3	CD7-3	
STM #6	BA4-4			BA4-3		BA4-0	BA4-4	BA4-0
STM #7	DA11-6	AB8-5	AB8-4	BC9-5	BC9-4	CD10-5	CD10-5	DA11-6
STM #8	DA15-8	AB12-7	AB12-6	BC13-7	BC13-6	CD14-7	CD14-7	DA15-8

1. A method of managing a synchronous digital hierarchy (SDH) subnetwork ring composed of a plurality of network elements coupled together through an optical fiber medium in which a plurality of channels are defined, each of said network elements comprising first and second high-speed interface modules for interfacing said network elements to one another through said optical fiber medium, and a low-speed interface module selectively coupled to said first and second high-speed interface modules, said method comprising the steps of:

generating a ring table comprising data representing ring characteristics for each of the network elements of the SDH ring, said ring characteristics including, for each of the network elements of the SDH ring, ring provisioning information for defining channel connectivities between the first and second high-speed interface modules and for defining channel connectivities between the low-speed interface module and each of the first and second high-speed modules of said SDH ring;

downloading said ring table to each of the network elements;

storing said ring table in each of said network elements; and

managing each of said network elements of said SDH ring according to said ring table.

5,815,491

METHOD AND APPARATUS FOR ADMITTING DATA TO A DIGITAL TELECOMMUNICATIONS NETWORK HAVING REGULATED ACCESS

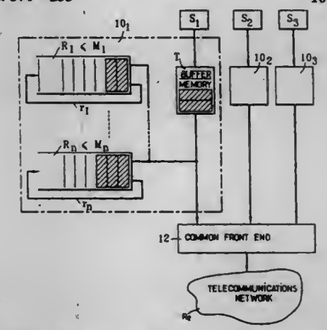
Jacky Guibert, Issy les Moulineaux, France, assignor to France Telecom, Paris, France

Filed Jun. 10, 1996, Ser. No. 661,107

Claims priority, application France, Jun. 15, 1995, 95 07144

Int. Cl.[6] H04J *3/22*

U.S. Cl. 370—233 **10 Claims**



1. A method for accepting data messages originating from a plurality of sources and each consisting of cells, and for admitting said messages into a digital telecommunications network, said method comprising the following steps, for each one of the sources, which has a predetermined peak transmission rate p:

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(a) allocating to said one of the sources a predetermined number n, n being an integer greater than 1, of reserves of tokens, each token representing a time duration which is a fraction of a cell duration, and each of said reserves having a respective determined capacity of tokens $M_1, \ldots, M_i, \ldots, M_n$;

(b) replenishing said reserves at respective predetermined rates $r_1, \ldots, r_i, \ldots, r_n$ with $r_1 > \ldots > r_i > \ldots > r_n$ and such that:

$$\frac{M_1}{p - r_1} < \ldots < \frac{M_i - M_{i-1}}{r_{i-1} - r_i} < \ldots < \frac{M_n - M_{n-1}}{r_{n-1} - r_n},$$

i.e.

$$\frac{M_i - M_{i-1}}{r_{i-1} - r_i} < \frac{M_{i+1} - M_i}{r_i - r_{i+1}}$$

for all integers i lying in the range 1 to n−1, with $M_0=0$ and $r_0=p$;

(c) storing the cells originating from said one of the sources in a FIFO access buffer memory;

(d) sending at least a first cell of a stored message from said access buffer memory as soon as each of said reserves contains a number of tokens that is at least equal to a length of said cell, at a first transmission rate, and simultaneously decreasing all said reserves by a number of tokens that corresponds to the length of said cell;

(e) once a first one of said reserves of capacity M_1, is exhausted, continuing to send cells of said stored message automatically at a second transmission rate lower than the first transmission rate and equal to said rate r_1 of replenishment of said first one of said reserves until the second reserve is exhausted; and

(f) continuing to send cells of said stored message automatically at successive decreasing transmission rates respectively equal to said replenishment rates $r_2, \ldots, r_n$.

5,815,492

DYNAMIC BANDWIDTH ESTIMATION AND ADAPTATION IN HIGH SPEED PACKET SWITCHING NETWORKS

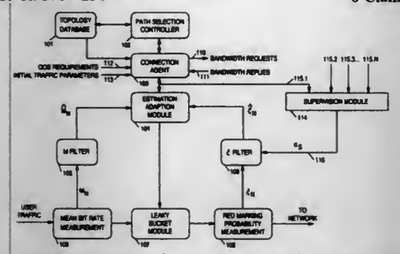
Jean-Marc Berthaud, Villeneuve-Loubet; Pierre-Andre Foriel, St. Laurent du Var; Claude Galand, Cagnes sur Mer; Stephane Lengelle, Antibes, and Laurent Nicolas, Villeneuve Loubet, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1997, Ser. No. 807,499

Claims priority, application European Pat. Off., Jun. 20, 1996, 96480087

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—234 **6 Claims**



1. A method for dynamically controlling access by data sources to a packet data communication network interconnecting source and destination nodes, each source node having at least one management system for controlling access to the network by a data source connected to the source node, including for each said data source the steps of:

measuring the mean bit rate of the traffic emanating from the data source;

controlling the flow of data packets from the data source into the network;

measuring the loss probability of data packets introduced into the network;

performing a low pass filter operation on the loss probability measurements;

defining adaption regions based on the simultaneous mean bit rate and loss probability measurements;

in response to pairs of said mean bit rate and loss probability measurements falling outside the adaption regions, requesting modification of the bandwidth allocated to the transmission of data packets;

measuring the average number of bandwidth modification requests; and

modifying the characteristics of the low pass filtering step as a function of the average number of bandwidth modification requests.

5,815,493

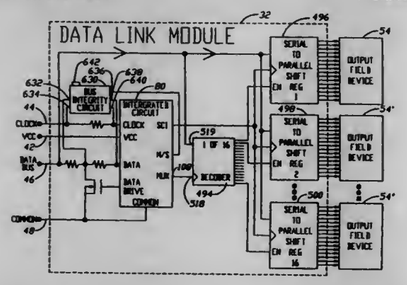
I/O MODULE FOR A SERIAL MULTIPLE DATA SYSTEM WITH A DATA BUS INTEGRITY CHECKER

Robert E. Riley, Jackson, Miss., assignor to Square D Company, Palatine, Ill.

Division of Ser. No. 305,253, Sep. 13, 1994, Pat. No. 5,553,070. This application Nov. 30, 1995, Ser. No. 565,037

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—242 **7 Claims**



1. A data bus integrity checker for use in an output module for receiving data signals from a data bus in a time division serial multiplex control system, the output module for controlling output devices in response to the received data signals, the data bus integrity checker comprising:

A. a first input terminal for receiving the data signals from the data bus;

B. a second input terminal for receiving timing signals from a clock bus;

C. an output terminal for controlling operation of the output module;

D. means for determining whether the data bus is intact in response to a test signal received from the data bus at a predetermined sync period of the timing signals received from the clock bus; and

E. means responsive to the determining means for permitting, through the output terminal, receipt by the output module of the data signals from the data bus if the data bus is intact.

5,815,494

LASER IRRADIATION APPARATUS AND LASER IRRADIATION METHOD

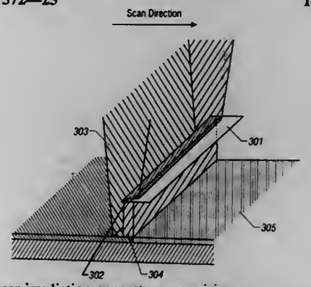
Shunpei Yamazaki, Tokyo; Koichiro Tanaka, and Naoto Kusumoto, both of Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Feb. 12, 1997, Ser. No. 800,026

Claims priority, application Japan, Feb. 13, 1996, 8-050888

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—25 **16 Claims**



1. A laser irradiation apparatus comprising:

means for producing linear pulse laser light having a step-like beam profile in a line-width direction, the beam profile including step sections each having a given irradiation energy density and a length L_n in the line-width direction; and

means for irradiating an irradiation object with the laser light while scanning the irradiation object with the laser light at a pitch D in the line-width direction,

wherein the length L_n and the pitch D satisfies $L_n \geqq D$.

5,815,495

SYSTEM FOR MANAGING COMMUNICATIONS BETWEEN ADAPTERS

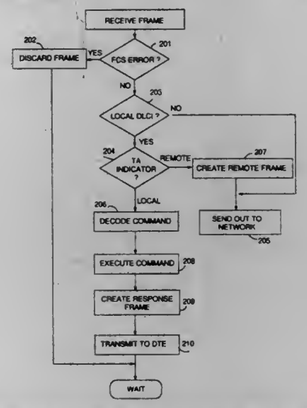
Youichi Saitoh, deceased, late of Zama, Japan, by Aeko Saitoh, Keisuke Saitoh, Akiko Saitoh, heirs; Naotaka Aoki, Yokohama, Japan, and Kian-Bon K. Sy, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1995, Ser. No. 425,541

Claims priority, application Japan, Apr. 28, 1994, 6-091699

Int. Cl.[6] H04Q *9/00*

U.S. Cl. 370—249 **4 Claims**



1. For use in a communication network having a plurality of terminals, each of which is connected to the network through a local adapter, said terminals transmitting data frames, each frame including an address field having an address unique to the intended destination of the frame, method for managing communications between terminals and adapters, comprising the steps of:

at a local terminal, retrieving the addresses of both the local adapter and a remote adapter;

at the local terminal, generating a frame including the local adapter address, a remote indicator indicating that the frame is intended for an adapter other than the local adapter, the remote adapter address and a command;

at the local terminal, transmitting the generated frame to the local adapter; and

at the local adapter, detecting the remote indicator and forwarding the frame into the network for transmission to the remote adapter identified by the remote adapter address.

5,815,496

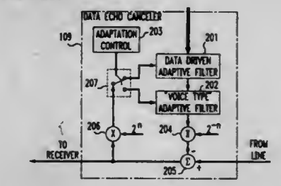
CASCADE ECHO CANCELER ARRANGEMENT

Richard Thomas Flanagan, Freehold, and Jean-Jacques Werner, Holmdel, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 29, 1995, Ser. No. 536,905

Int. Cl.[6] H04B *3/23*

U.S. Cl. 370—287 **3 Claims**



1. An echo canceler arrangement comprising:

a first adaptive filter having a relatively long echo path impulse response synthesis capability;

an at least second adaptive filter connected in series with said first adaptive filter and having a relatively short echo path impulse response synthesis capability as compared to the echo path impulse response synthesis capability of said first adaptive filter, an output from said second adaptive filter being an estimate of any echo in a received line signal, said at least second adaptive filter including at least one tap coefficient, wherein said at least one tap coefficient is initially set to a predetermined value;

means for algebraically subtracting said echo estimate from said received line signal; and

means for controlling the adaptation of said first and second adaptive filters, wherein said first adaptive filter is controlled by said means for controlling to adapt during a predetermined initial training interval, and wherein after said initial training interval said first adaptive filter is inhibited by said means for controlling from further adaptation.

5,815,497

METHOD OF TRANSMISSION BY PACKETS BETWEEN A PLURALITY OF TRANSMITTERS AND AT LEAST ONE RECEIVER AND TRANSMITTER AND RECEIVER IMPLEMENTING THIS METHOD

Louis Ramel, Annay-sous-Auneau, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 352,029, Nov. 30, 1994, abandoned. This application Dec. 7, 1995, Ser. No. 568,555

Claims priority, application France, Nov. 30, 1993, 93 14309

Int. Cl.[6] H04J *1/00;13/02*

U.S. Cl. 370—342 **1 Claim**

1. A method of transmission by transmission data packets on carrier frequencies wherein said transmission occurs between a plurality of transmitters and at least one receiver and wherein said

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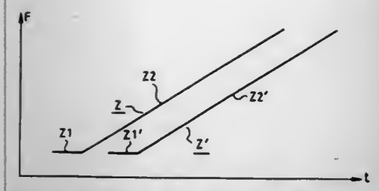


transmission data packets have different durations wherein values of said different durations do not exceed a predetermined value, the method comprising the steps of:

defining, as a model a standard packet having a duration value equal to said predetermined value, said standard packet being formed by a preliminary data segment followed by a remaining data segment wherein said remaining data segment is transmitted in one frequency ramp having a frequency variation which is a function of time;

defining truncated standard packets in the form of said standard packet including a corresponding preliminary data segment and remaining data segment but with a duration of the remaining data segment at the most equal to the duration of the remaining data segment of the standard packet;

forming said transmission data packets in the form of truncated standard packets;

receiving said transmission data packets by said at least one receiver; and

identifying said transmission data packets in the form of said truncated standard packets by monitoring reception of corresponding ones of said preliminary segments of said transmission packets.

5,815,498

TRANSMISSION SYSTEM FOR ATM CELLS THROUGH A PASSIVE LOCAL NETWORK

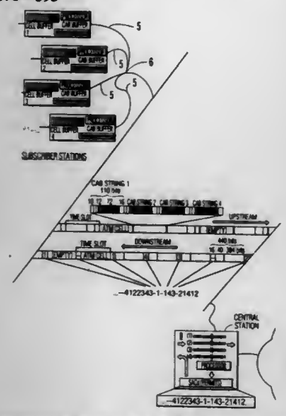
Mark Johannes Gerardus Dirksen, Leidschendam, Netherlands, assignor to Koninklijke PTT Nederland N.V., Groningen, Netherlands

Filed Oct. 17, 1995, Ser. No. 544,210

Claims priority, application Netherlands, Oct. 14, 1994, 9401697

Int. Cl.[6] H04L *12/28;12/56*

U.S. Cl. 370—395 **1 Claim**



1. A transmission method for ATM cells presented by local stations to a central station, and for ATM cells presented by the central station to the local stations, said method comprising the steps of:

storing a cell destined for the central station in a cell buffer of one of the local stations and writing a first character to a register of said local station when the cell destined for the central station is presented in said local station;

writing a second character to the register of said local station when an empty time slot is present in said local station;

periodically reading the register of each of the local stations;

transmitting contents of the read local registers of the local stations to the central station as register codes; and

transmitting permit codes from the central station to the local stations based on a location of said first characters in the registers, said permit codes signifying permission to transmit a cell during a specific time slot.

5,815,499

ATM SWITCH ADDRESS GENERATING CIRCUIT

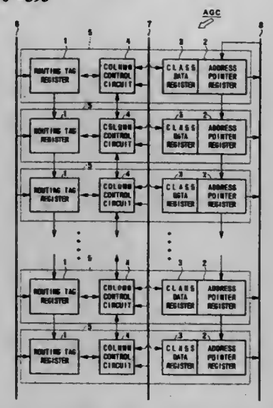
Yasuo Unekawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jul. 12, 1996, Ser. No. 679,492

Claims priority, application Japan, Jul. 13, 1995, 7-177609

Int. Cl.[6] H04L *12/54*

U.S. Cl. 370—395 **12 Claims**



1. An address generating circuit of shared buffer type asynchronous transfer mode switch used for an asynchronous transfer mode switching system, which comprises:

a plurality of address generating units (5) each provided for each column, for storing a routing tag indicative of an output port of each cell stored in a shared buffer (10), an address of each cell, and class data indicative of a service class of each cell, respectively; and wherein:

when a cell is inputted to or outputted from the shared buffer (10), a routing tag and an address stored in each address generating unit storing the class data the same as the class data of the inputted or outputted cell are selected and used.

5,815,500

NETWORK CONNECTION DEVICE

Takahiro Murono, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1996, Ser. No. 758,098

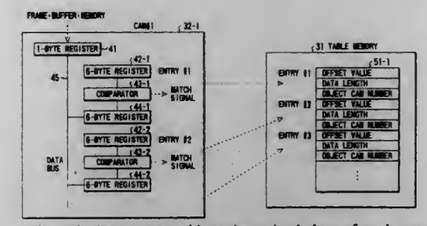
Claims priority, application Japan, Dec. 1, 1995, 7-314071

Int. Cl.[6] H04L *12/46*

U.S. Cl. 370—401 **10 Claims**

1. A network connection device comprising:

a plurality of checking means, each having predetermined data stored in each of a plurality of entries in advance, for checking whether or not said predetermined data of each entry corresponds to data of a frame transmitted from a sender network;



storing means, provided to correspond to each entry of said checking means, for storing data indicating other checking means to be searched next and an address of a destination network;

address obtaining means for obtaining the address of the destination network of the frame from the sender network by use of the data and the address stored in said storing means and said checking means when said checking means checks that said predetermined data corresponds to the data of the frame from the sender network;

setting means for setting the address of the frame from the sender network in place of the address of the destination network obtained by said address obtaining means when said address obtaining means obtains the address of the destination network; and

transmitting means for transmitting the frame having the address of the destination network set by said setting means to the sender network.

5,815,501

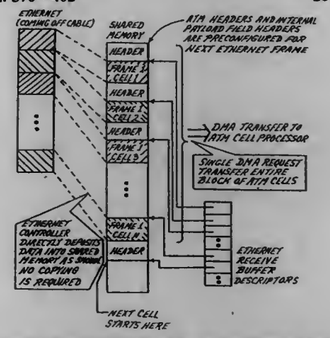
ATM-ETHERNET PORTAL/CONCENTRATOR

Michael E. Gaddis; Richard G. Bubenik, both of St. Louis; Pierre Costa, Bridgeton, and Noritaka Matsuura, St. Louis, all of Mo., assignors to Washington University, and SBC Technology Resources, Inc., both of St. Louis, Mo.

Continuation of Ser. No. 427,148, Apr. 4, 1995, abandoned, which is a continuation of Ser. No. 894,445, Jun. 5, 1992, Pat. No. 5,457,681. This application Apr. 9, 1997, Ser. No. 827,658

Int. Cl.[6] H04L *12/66*

U.S. Cl. 370—402 **26 Claims**



1. A portal for interconnection between an Ethernet segment and an ATM network, each of said Ethernet segment and said ATM network transmitting data in a particularized format, said Ethernet data format being different than said ATM data format, said portal having a memory for storing data received from at least said Ethernet segment, means for generating and storing ATM formatting data into said memory so that as data in Ethernet format is stored in said memory it becomes associated with appropriate ATM formatting data, and means for converting data received in either of said formats to the other of said formats by segmenting Ethernet frames into ATM cells and by reassembling ATM cells into Ethernet frames to thereby permit the free flow of data between said Ethernet segment and said ATM network.

5,815,502

INFORMATION TRANSMISSION SYSTEM WITH VARIABLE TRANSMISSION RATE

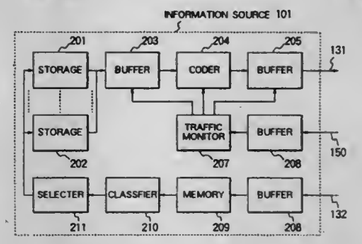
Atsushi Saito, Ichikawa; Yoshitaka Takasaki, Tokorozawa; Taizo Kinoshita, Musashimurayama, and Shigeki Kitajima, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 226,301, Apr. 12, 1994, Pat. No. 5,515,368. This application Jan. 2, 1996, Ser. No. 581,966

Claims priority, application Japan, Apr. 13, 1993, 5-085876

Int. Cl.[6] H04J *3/22*

U.S. Cl. 370—468 **3 Claims**



1. An information providing apparatus for providing information to a receiver via a transmission line, comprising:

a plurality of storages for storing information;

a first buffer for storing information transmitted at a fixed transmission rate from said plurality of storages;

a precoder for processing information transmitted at a variable transmission rate from said first buffer;

a second buffer for storing information transmitted at a variable transmission rate from said precoder; and

means for providing information transmitted from said second buffer to said transmission line at a variable transmission rate.

5,815,503

DIGITAL SIMULTANEOUS VOICE AND DATA MODE SWITCHING CONTROL

Ping Li, New Brighton, N.Y., assignor to Multi-Tech Systems, Inc., Mounds View, Minn.

Continuation of Ser. No. 142,807, Oct. 25, 1993, Pat. No. 5,535,204, which is a continuation-in-part of Ser. No. 2,467, Jan. 8, 1993, Pat. No. 5,452,289. This application Apr. 19, 1996, Ser. No. 634,828

Int. Cl.[6] H04J *3/12*

U.S. Cl. 370—471 **12 Claims**

1. In a multi-function communications system, a method of switching from data communication to voice-over-data communication, comprising the steps of:

invoking a data communication connection between a local site equipped with a local modem and a remote site equipped with a remote modem;

alerting the local modem of a desire to switch from data mode to voice over data mode;

sending a ringdown data packet from the local modem to the remote modem;

receiving the ringdown data packet at the remote modem and sending in response thereto a ringback data packet from the remote modem to the local modem; and

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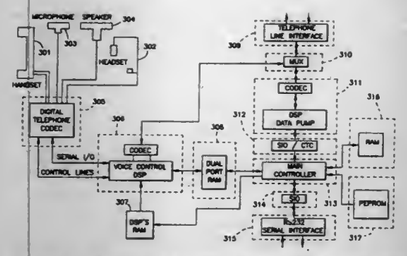


enabling a voice over data connection between the local modem and the remote modem.

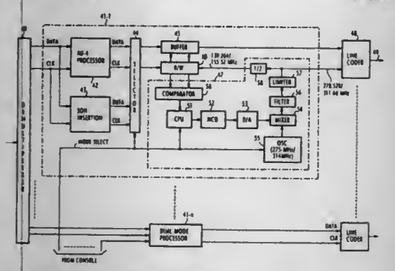
5,815,504

PDH/SDH SIGNAL PROCESSOR WITH DUAL MODE CLOCK GENERATOR

Takashi Doi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 13, 1996, Ser. No. 647,689
Claims priority, application Japan, May 12, 1995, 7-114204
Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—503 **6 Claims**



1. A signal processor comprising:

a first circuit for extracting a plesiochronous digital hierarchy (PDH) signal from an incoming synchronous digital hierarchy (SDH) signal to produce a PDH output signal;

a second circuit for adding an overhead to an incoming pure SDH-signal to produce a synchronous transport module (STM) output signal;

a selector for selecting one of the output signals of the first and second circuits;

a local oscillator for producing a first clock signal when the output signal of the first circuit is selected and a second clock signal when the output signal of the second circuit is selected;

a buffer;

read/write means for storing the selected output signal into the buffer at a first rate and reading the stored signal from the buffer at a second rate;

a comparator for detecting a difference between the first and second rate;

a microprocessor-controlled oscillator operating in a frequency synthesizer mode when the output signal of the first circuit is selected and in a phase locked mode when the output signal of the second circuit is selected, the microprocessor-controlled oscillator being responsive to said difference for producing a clock signal whose intervals are averaged during the frequency synthesizer mode and whose intervals are located to said difference during the phase locked mode; and

mixer means for mixing the clock signal from the microprocessor-controlled oscillator with either of the first and second clock signals from the local oscillator to produce a line clock signal, and setting the second rate of the read/write means according to the line clock signal.

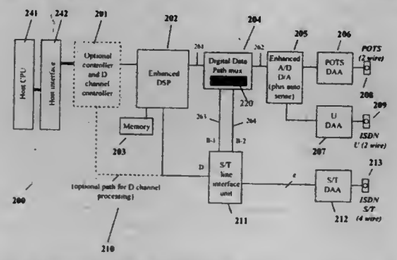
5,815,505

COMBINED ANALOG AND DIGITAL COMMUNICATIONS DEVICE

Andrew Mills, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 13, 1996, Ser. No. 696,201
Int. Cl.[6] H04Q *11/00*

U.S. Cl. 370—522 **29 Claims**



1. A communications device, comprising:

a first connector adapted for coupling to a POTS telephone line;

a second connector adapted for coupling to an ISDN telephone line and configured to provide an ISDN U interface;

a third connector adapted for coupling to an ISDN telephone line and configured to provide an ISDN S/T interface; and

a digital signal processing (DSP) core, wherein the digital signal processing core is configured to perform:

analog modem functions when the first connector is coupled to a POTS telephone line;

ISDN signal processing functions and ISDN S/T and U interface functions when the second connector is coupled to an ISDN telephone line;

ISDN signal processing functions and ISDN S/T interface functions when the third connector is coupled to an ISDN telephone line; and

a digital data path multiplexer operably coupled between the DSP core and the first, second, and third connectors, wherein the digital data path multiplexer includes autosense logic which monitors signals received from a telephone line connected to one of the first, second, and third connectors, and wherein the autosense logic determines a data transfer mode based upon the received signals, and wherein the autosense logic provides information regarding the determined data transfer mode to the DSP core, and wherein the DSP core receives the information regarding the determined data transfer mode and performs operations according to the determined data transfer mode.

5,815,506

METHOD FOR PROVIDING AN OVERLAY SHORT MESSAGING SERVICE IN A MOBILE SATELLITE COMMUNICATION SYSTEM

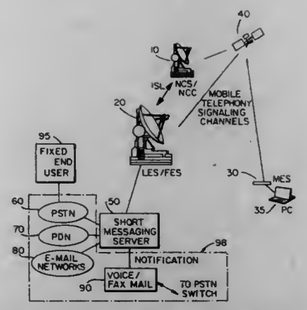
Dilip Gokhale, Gaithersburg, Md., assignor to Comsat Corporation, Bethesda, Md.

Filed Jun. 24, 1996, Ser. No. 668,822
Int. Cl.[6] H04J *3/12*

U.S. Cl. 370—524 **20 Claims**

1. A method of providing an overlay short messaging service in a mobile satellite communication system including a land earth station which communicates with a mobile earth station via a satellite, said method comprising the steps of:

selecting a short messaging service; and



transmitting a short message from one of said land earth station or said mobile earth station via said satellite to the other of said land earth station or said mobile earth station;

wherein during said step of transmitting, said short message is transmitted in one of a plurality of out-of-band signalling channels at a time when no signalling information is being transmitted; and

wherein said step of transmitting a short message further comprises the step of identifying whether the transmission involves one of a transfer of said short message from said land earth station to said mobile earth station or a transfer of said short message from said mobile earth station to said land earth station.

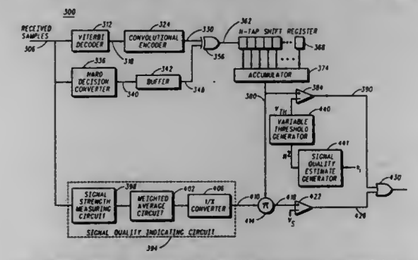
5,815,507

ERROR DETECTOR CIRCUIT FOR DIGITAL RECEIVER USING VARIABLE THRESHOLD BASED ON SIGNAL QUALITY

Niels Vinggaard, and Arvind S. Arora, both of Arlington Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1996, Ser. No. 632,701
Int. Cl.[6] G06F *11/00; 11/10*

U.S. Cl. 371—5.1 **20 Claims**



19. A bad frame indicator for a digital receiver, comprising:

a first circuit for generating a first error signal of a value representative of a number of erroneous signal values in a frame input to the digital receiver;

a second circuit generating respective estimated signal quality signals representative of signal quality of each of a plurality of segments of the frame input to the digital receiver;

a threshold generator coupled to the second circuit to derive a variable threshold as a function of a number of the segments of the frame that are determined to be bad based upon the respective estimated signal quality signal for each segment; and

a signal generator coupled to the threshold generator and the first circuit for generating a received-signal sequence error signal when the first error signal is of a value beyond the variable threshold, wherein generation of the received-signal sequence error signal is indicative of when the frame input to the digital receiver is comprised of an excessive number of signal portions of erroneous signal values.

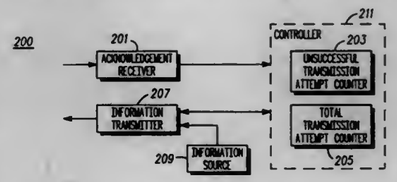
5,815,508

METHOD AND APPARATUS FOR PROVIDING INFORMATION BETWEEN COMMUNICATION DEVICES

Paul E. Wadzinske; Gregory A. Feeney, both of Palatine, and Donald G. Newberg, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 11, 1996, Ser. No. 728,719
Int. Cl.[6] G06F *11/00;* **G08C** *25/02*

U.S. Cl. 371—5.1 **19 Claims**



19. A communication device comprising:

an unsuccessful transmission attempt counter that is incremented only when the communication device determines that a target communication device did not receive at least a portion of information previously transmitted by the communication device;

a total transmission attempt counter that is incremented upon each transmission of at least a portion of the information, regardless of whether or not such transmission is successful or unsuccessful; and

an information transmitter, coupled to the unsuccessful transmission attempt counter and the total transmission attempt counter, to retransmit information when a value of the unsuccessful transmission attempt counter is less than an unsuccessful transmission attempt threshold value and when a value of the total transmission attempt counter is less than a total transmission attempt threshold value, wherein the total transmission attempt threshold value is greater than the unsuccessful transmission attempt threshold value.

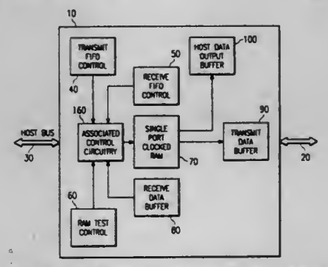
5,815,509

METHOD AND SYSTEM FOR TESTING MEMORY

Brian Tse Deng, 1117 Windsong Trail, Richardson, Tex. 75081; Henry N. Angulo, 3829 Rolling Hills Dr., Plano, Tex. 75025, and Bob Gugel, 810 O'Phelan La., Dallas, Tex. 75044

Filed Sep. 19, 1997, Ser. No. 934,156
Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—21.2 **20 Claims**



1. A parallel to serial interface for connecting a parallel host bus to an IEEE 1394 serial bus, the interface comprising:

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a random access memory having a plurality of memory locations for temporarily storing data received from either the parallel host bus or the IEEE 1394 serial bus, the random access memory being logically divided into a transmit memory portion and a receive memory portion;

a transmission control unit operable to control transmission of data from the parallel host bus to the serial bus, the transmission control unit further operable to access the transmit memory portion of the random access memory;

a reception control unit operable to control reception of data by the parallel bus from the IEEE 1394 serial bus, the receive control unit further operable to access the receive memory portion of the random access memory; and

a test unit operable to:

selectively obtain control of the random access memory based on a control signal received from the parallel host bus;

internally generate addresses for each memory location within the random access memory;

control transmission of parallel data from each memory location associated with the internally generated addresses to the parallel host bus for inspection; and

selectively relinquish control of the random access memory to allow transmission of data between the IEEE 1394 serial bus and the parallel host bus.

5,815,510

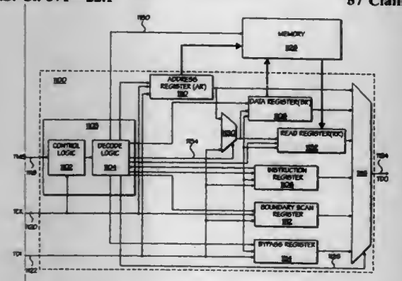
SERIAL PROGRAMMING OF INSTRUCTION CODES IN DIFFERENT NUMBERS OF CLOCK CYCLES

Christopher W. Jones, Pleasanton; James B. MacArthur, Santa Clara, and Anita X. Meng, Milpitas, all of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Filed Mar. 28, 1996, Ser. No. 624,193

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—22.1 **87 Claims**



1. A method of instructing a device to perform at least one function for testing said device having an instruction storage element comprising a first number of bits and requiring a first number of clock cycles to serially load said first number of bits, the method comprising the steps of:

serially shifting a first instruction into said instruction storage element in a second number of clock cycles to instruct said device to perform said at least one function; and

serially shifting a second instruction into said instruction storage element in a third number of clock cycles to instruct said device to perform another function, wherein said third number of clock cycles is less than said first number of clock cycles.

5,815,511

SEMICONDUCTOR INTEGRATED CIRCUIT EQUIPPED WITH TEST CIRCUIT

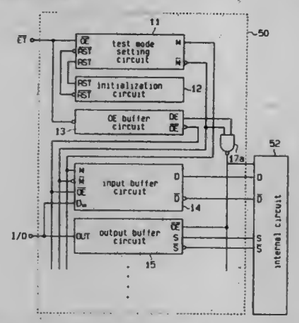
Yasuhiro Yamamoto, Kasugai, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 11, 1996, Ser. No. 728,978

Claims priority, application Japan, Oct. 13, 1995, 7-265927

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—22.5 **22 Claims**



1. A semiconductor integrated circuit device comprising:

a plurality of input/output terminals;

an input terminal;

an internal circuit for receiving input data via said plurality of input/output terminals and outputting output data therefrom; and

a test circuit for permitting data exchange among said plurality of input/output terminals, said input terminal and said internal circuit,

wherein said test circuit operates in a normal mode to supply input data to said internal circuit through said input/output terminals, and supply output data from said internal circuit through said input/output terminals, and said test circuit operates in a test mode to supply test input data to said internal circuit through one of said input terminal and said input/output terminals, and to supply test output data that is output from said internal circuit to one of said input terminal and said input/output terminals which differs from said test input data supplied terminal.

5,815,512

SEMICONDUCTOR MEMORY TESTING DEVICE

Tokuya Osawa, and Hideshi Maeno, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 316,485, Sep. 30, 1994. This application May 4, 1995, Ser. No. 434,999

Claims priority, application Japan, May 26, 1994, 6-112638; Jun. 29, 1994, 6-147450; Jul. 25, 1994, 6-172348; Nov. 21, 1994, 6-286631

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—22.31 **33 Claims**

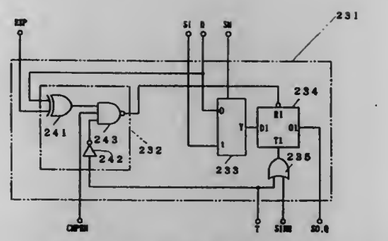
1. A semiconductor memory testing device comprising a plurality of scan registers connected in series with each other for forming a scan path,

each said scan register comprising:

a comparison circuit for comparing an external expected data signal with an external data input signal based on an external comparison enable signal, and for outputting a comparison result signal;

selector means for selecting and outputting at least a desired external signal and said data input signal based on an external shift mode control signal;

a flip-flop circuit for capturing output data from said selector means at a prescribed timing;



a reset circuit for resetting said flip-flop circuit with a prescribed value based on the comparison result signal output from said comparison circuit; and

data holding means for allowing said data capturing of said flip-flop circuit in accordance with said prescribed timing based on an external one-phase cyclic clock signal when no shift inhibiting signal is received from an external source while holding data of said flip-flop circuit when said shift inhibiting signal is received from the external source.

5,815,513

TEST PATTERN PREPARATION SYSTEM

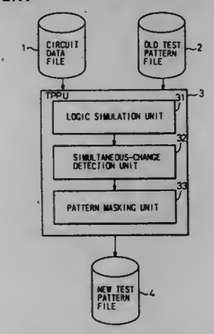
Takahisa Hiraide, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 271,746, Jul. 7, 1994, abandoned. This application Mar. 20, 1997, Ser. No. 821,728

Claims priority, application Japan, Sep. 30, 1993, 5-244955

Int. Cl.[6] G01R *31/28;* **G06F** *11/00;3/00;* **G06G** *7/48*

U.S. Cl. 371—27.4 **3 Claims**



1. A test pattern preparation system for testing an LSI circuit, the system comprising:

a circuit data file storing circuit data;

an old test signal pattern file storing old test signal patterns;

a test signal pattern preparation means, operatively connected to the circuit data file and the old test signal pattern file, for performing a logic simulation, detecting simultaneous-change action based on a result of the logic simultaneous-change action based on a result of the logic simulation, and preparing a new test signal pattern in accordance with the circuit data and the old test signal patterns; and

a new test signal pattern file operatively connected to the test signal pattern preparation means for storing the new test signal pattern prepared by the test signal pattern preparation means, and

wherein said test signal pattern preparation means comprises:

a logic simulation unit receiving the circuit data from the circuit data file and the old test signal patterns from the old test signal pattern file; performing the logic simulation in consideration of signal delay; and recording names of input/output pins at which a signal level was changed, any change of the signal level before and after the change, and the time when the signal level changed;

a simultaneous-change detection unit calculating a sum of noise levels at input/output pins which are provided in vicinity of a target input/output pin to be checked in accordance with the result of the logic simulation, and recording the sum of the noise levels caused by the simultaneous-change action at the input/output pins when the sum of the noise levels exceeds a threshold value which is previously determined; and

a pattern masking unit setting the signal levels at input/output pins, where noises are considered, to a DON'T CARE value, performing a re-simulation, and masking all expected values on the test pattern at the output pins, when influence of the noise is propagated to the DON'T CARE value.

5,815,514

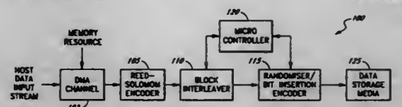
VARIABLE RATE BIT INSERTER FOR DIGITAL STORAGE

Martin D. Gray, La Jolla, Calif., assignor to Overland Data, Inc., San Diego, Calif.

Filed Feb. 9, 1996, Ser. No. 599,149

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—42 **14 Claims**



1. An apparatus for error encoding a digital data stream to be stored onto a data storage medium, said apparatus comprising:

a data stream input terminal configured to receive an input data stream; monitoring device which monitors said data stream to determine if a bit insertion is to be performed;

a bit inserter which inserts one or more bits into said data stream, at a rate which varies depending on said input data stream content, after said code monitoring device determines that a bit insertion is to be performed thereby producing an encoded output data stream; and

a write head configured to receive said encoded output data stream and to write said encoded data stream onto said data storage medium.

5,815,515

EDGE METRIC CALCULATION METHOD AND APPARATUS USING PERMUTATIONS

Dariush Dabiri, San Jose, Calif., assignor to LSI Logic Corporation

Filed Mar. 21, 1997, Ser. No. 822,412

Int. Cl.[6] H03M *13/12*

U.S. Cl. 371—43.7 **9 Claims**

1. An apparatus for Viterbi decoding which comprises a survivor weight unit which includes:

a metric unit configured to receive an encoded signal and compute a pair of metric values which corresponds to a plurality of transitions between a pair of states at time t to a pair of states at time t+1;

an array of first and second computation units coupled together to implement a decoder trellis time step between time t and time t+1, half of said array being composed of first computation units of a first type and half of said array being composed of second computation units of a second type, wherein a chosen computation unit is configured to select a surviving one of said plurality of transitions for each of the pair of states

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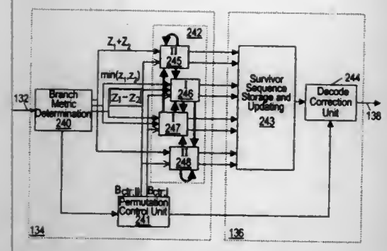


at time t+1, said chosen computation unit still further configured to calculate a surviving weight for each of the pair of states at time t+1;

a permutation control unit configured to steer the output of the computation units so as to (i) ensure that the chosen computation unit is one of said first computation units if each of said pair of metric values is nonzero and to (ii) ensure that the chosen computation unit is one of said second computation units if one of said pair of metric values is zero.

5,815,516

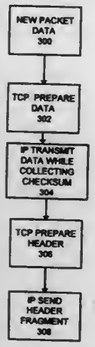
METHOD AND APPARATUS FOR PRODUCING TRANSMISSION CONTROL PROTOCOL CHECKSUMS USING INTERNET PROTOCOL FRAGMENTATION

Kenneth Dale Aaker; Gary Scott Delp; Lee Anton Sendelbach, all of Rochester, and Albert Alfonse Slane, Oronoco, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1996, Ser. No. 628,826

Int. Cl.[6] H03M *13/00;* **H01J** *13/00*

U.S. Cl. 371—53 **15 Claims**



1. A method for producing transmission control protocol (TCP) checksums using internet protocol (IP) fragmentation comprising the steps of:

receiving packet data to be transmitted and preparing a first internet protocol data fragment without a checksum for the received packet data; said first internet protocol data fragment including an internet protocol header, and said internet protocol header having a fragment offset value equal to a set value for a transmission control protocol (TCP) header and having a total length value reduced by said set value;

transmitting said first internet protocol data fragment to a receiving system and collecting checksum while transmitting said internet protocol data fragment; and

after transmission of said first internet protocol data fragment, transmitting an internet protocol header fragment; said internet protocol header fragment including a modified internet protocol header and a transmission control protocol (TCP) header; said modified internet protocol header having a fragment offset value equal to zero and having a total length value equal to a total of said set value and a predetermined value for said internet protocol header; said transmission control protocol (TCP) header including said collected checksum.

5,815,517

METHOD AND APPARATUS FOR GENERATING SUPER HARD LASER

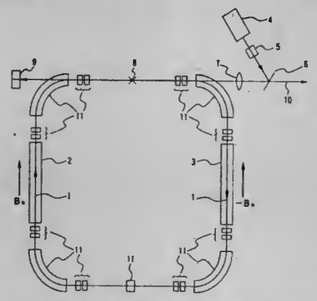
Hidetsugu Ikegami, Takarazuka, Japan, assignor to Japan Science and Technology Corporation, Japan

Filed Feb. 6, 1997, Ser. No. 796,524

Claims priority, application Japan, Feb. 19, 1996, 8-030203

Int. Cl.[6] H01S *3/00*

U.S. Cl. 372—2 **8 Claims**



1. A method of generating a super hard laser, comprising the steps of:

simultaneously performing uniformization of the energy of an electron beam in an electron storage ring and formation of pulses of the electron beam through gyration phase bunching so as to convert the stored electron beam into a coherent electron beam having a high degree of time coherence; and

projecting a laser beam in a direction opposite to the traveling direction of the coherent electron beam so as to induce coherent Compton scattering of the laser beam.

5,815,518

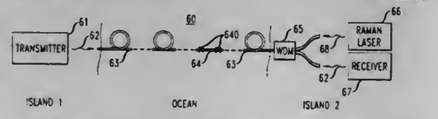
ARTICLE COMPRISING A CASCADED RAMAN FIBER LASER

William Alfred Reed, Summit; Andrew John Stentz, Scotch Plains, and Thomas A. Strasser, Chatham, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 6, 1997, Ser. No. 871,023

Int. Cl.[6] H01S *3/30;* **G02B** *6/34*

U.S. Cl. 372—6 **15 Claims**



1. An article comprising a Raman fiber laser adapted for receiving pump radiation of wavelength λ_p, and for emitting output radiation of wavelength $\lambda_s>\lambda_p$, the Raman fiber laser comprising

a) a length of optical fiber comprising an intracavity section of length L disposed between an input section and an output section, said input section and output section each comprising fiber Bragg gratings having center wavelengths $\lambda_1, \lambda_2 \ldots \lambda_n$, where $n \geqq 2$ and $\lambda_1<\lambda_2< \ldots \lambda_n$;

CHARACTERIZED IN THAT

b) in the input section the fiber Bragg gratings of center wavelengths $\lambda_1, \lambda_2 \ldots \lambda_n$ are disposed in sequence according to center wavelength, with center wavelength increasing with increasing distance from the intracavity section;

c) in the output section the fiber Bragg gratings of center wavelengths $\lambda_1, \lambda_2 \ldots \lambda_{n-1}$ are disposed in sequence according to center wavelength, with center wavelengths increasing with increasing distance from the intracavity section; and

d) in the output section the fiber Bragg grating of center wavelength λ_n is disposed between the intracavity section and the fiber Bragg grating with center wavelength λ_{n-1}.

5,815,519

ULTRASHORT PULSE LASER APPARATUS

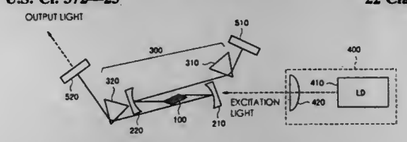
Shinichiro Aoshima; Haruyasu Ito, and Yutaka Tsuchiya, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics, K.K., Hamamatsu, Japan

Filed Feb. 11, 1997, Ser. No. 799,656

Claims priority, application Japan, Mar. 25, 1996, 8-068725

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—25 **22 Claims**



1. An ultrashort pulse laser apparatus comprising:

a laser medium;

a laser resonator which stores said laser medium and externally extracts a laser beam; and

an excitation source for outputting an excitation energy to said laser resonator to excite said laser medium,

wherein said laser resonator comprising:

a plurality of resonant mirrors disposed on both sides of said laser medium to form a resonant optical path; and

a phase dispersion compensation unit which includes two optical members respectively arranged on two light input/output surface sides of said laser medium on the resonant optical path and compensates phase dispersion of light in the resonant optical path.

5,815,520

LIGHT EMITTING SEMICONDUCTOR DEVICE AND ITS MANUFACTURING METHOD

Yuji Furushima, Tokyo, Japan, assignor to NEC Corporation, Japan

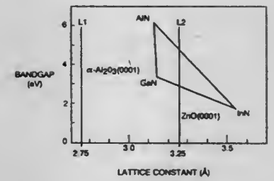
Filed Jun. 21, 1996, Ser. No. 670,717

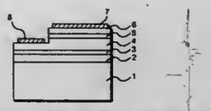
Claims priority, application Japan, Jul. 27, 1995, 7-192075

Int. Cl.[6] H01L *33/00;* **H01S** *3/19;3/18*

U.S. Cl. 372—45 **9 Claims**

1. A light emitting semiconductor device comprising a sapphire substrate having a ZnO buffer layer formed on a surface of said





sapphire substrate, and a layer of $In_xGa_yAl_{1-x-y}N$ (where, $0 \leqq x \leqq 1$, $0 \leqq x+y \leqq 1$) formed on said ZnO buffer layer.

5,815,521

SEMICONDUCTOR LASER WITH LOW BEAM DIVERGENCE

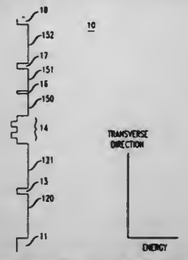
William Scott Hobson, Summit, and Daryoosh Vakhshoori, Chatham Township, Morris County, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 602,427, Feb. 16, 1996, abandoned.

This application Aug. 7, 1997, Ser. No. 906,655

Int. Cl.[6] H01S *3/19;* **G02B** *6/10*

U.S. Cl. 372—45 **10 Claims**



1. An article comprising a semiconductor laser, said laser comprising a semiconductor layer structure on a substrate, and contacts that facilitate flowing a current through the layer structure;

the layer structure comprises at least one layer of a first conductivity type, at least one layer of a second conductivity type, and an active region between said layers of first and second conductivity type;

the layer structure is selected to form a waveguide for laser radiation of wavelength λ, said waveguide comprising a lower cladding region, an upper cladding region, and a core region between said lower and upper cladding regions, with the core region comprising at least a portion of the active region and having an effective refractive index at wavelength λ that is larger than the refractive index at wavelength λ of at least a portion of each of the lower and upper cladding layers;

CHARACTERIZED IN THAT

each of said lower and upper cladding regions comprises a single mode-shaping layer having a thickness, being spaced apart from the core region and having a larger refractive index at wavelength λ than the portions of the respective cladding region that are contiguous with the mode-shaping layer; the refractive index and spacing from the core region of the respective mode-shaping layers selected such that a laser mode diameter is increased and a transverse laser mode is stable, said spacing of the respective mode shaping layers from the core region being greater than the thickness of the respective mode-shaping layers.

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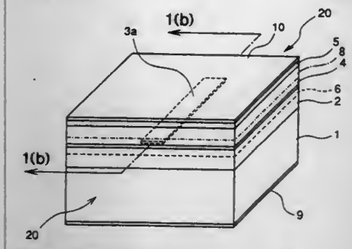
5,815,522

SEMICONDUCTOR LASER

Yutaka Nagai, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1996, Ser. No. 584,201
Claims priority, application Japan, Apr. 5, 1995, 7-080222
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **2 Claims**



1. A semiconductor laser comprising:

a first conductivity type GaAs substrate having a front surface and a rear surface;

a first conductivity type $Al_xGa_{1-x}As$ ($0<x<1$) lower cladding layer disposed on the front surface of the substrate;

a quantum well structure active layer disposed on the lower cladding layer, comprising a plurality of $Al_zGa_{1-z}As$ ($0<z<x$) barrier layers and at least one $Al_yGa_{1-y}As$ ($0<y<z$) well layer, two of the barrier layers sandwiching the quantum well structure active layer and functioning as light guide layers, and having a region disordered by In due in the vicinity of a laser resonator facet;

a second conductivity type $Al_rGa_{1-r}As$ ($z<r<1$) upper cladding layer disposed on the quantum well structure active layer;

a second conductivity type GaAs contact layer disposed on the upper cladding layer;

a first electrode disposed on the rear surface of the substrate; and

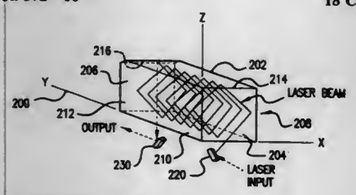
a second electrode disposed on the contact layer.

5,815,523

VARIABLE POWER HELIX LASER AMPLIFIER AND LASER

Henry B. Morris, Mesa, Ariz., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 27, 1996, Ser. No. 758,003
Int. Cl.[6] H01S *3/06;3/07*
U.S. Cl. 372—66 **18 Claims**



1. A variable power laser device comprising:

a lasing medium including first and second end faces, N side faces extending between said first and second end faces, and a bevel face located at an intersection between said second end and one of said side faces;

a first input mirror proximate to said first end face for directing a first laser beam into said lasing medium so as to permit said first laser beam to follow a helical transmission path defined by said N side faces, said transmission path being longer than the length of any of said N side faces and having at least one loop; and

an output mirror proximate to said second end face for receiving an amplified laser beam output from said lasing medium and reflecting said amplified laser beam in a predetermined direction,

wherein N is an integer greater than or equal to 3,

wherein output power of said amplified laser beam is dependent on the number of loops in said helical transmission path, and

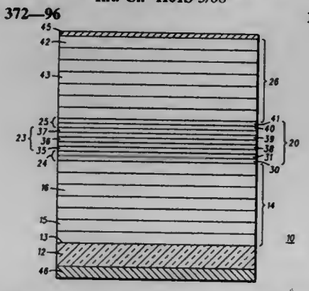
wherein an angular orientation of said first input mirror determines the number of loops in said helical transmission path.

5,815,524

VCSEL INCLUDING GATLP ACTIVE REGION

Jamal Ramdani, Gilbert; Michael S. Lebby, Apache Junction, and Wenbin Jiang, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1997, Ser. No. 806,269
Int. Cl.[6] H01S *3/08*
U.S. Cl. 372—96 **16 Claims**



1. A vertical cavity surface emitting laser for emitting long wavelength light, the vertical cavity surface emitting laser comprising:

a first mirror stack;

a GaTlP active region with a quantum well, the active region being disposed on the first mirror stack; and

a second mirror stack disposed on the active region.

5,815,525

MULTI-BAND, MULTI-MODE SPREAD-SPECTRUM COMMUNICATION SYSTEM

Douglas G. Smith, Arlington, Va.; Robert C. Dixon, Palmer Lake, and Jeffrey S. Vanderpool, Colorado Springs, both of Colo., assignors to Omnipoint Corporation, Colorado Springs, Colo.

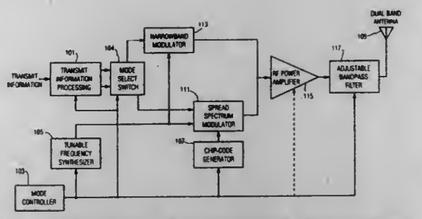
Division of Ser. No. 293,671, Aug. 18, 1994, which is a continuation-in-part of Ser. No. 146,492, Nov. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 59,021, May 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 976,700, Nov. 16, 1993, abandoned, and Ser. No. 206,045, Mar. 3, 1994, abandoned, which is a continuation of Ser. No. 948,293, Sep. 18, 1992, Pat. No. 5,291,516, which is a continuation of Ser. No. 698,694, May 13, 1991, abandoned. This application Mar. 27, 1996, Ser. No. 622,812
Int. Cl.[6] H04K *1/00;* **H04L** *27/04;24/06*
U.S. Cl. 375—200 **27 Claims**

1. A transmitter comprising:

a mode controller for selecting between a first fixed mode and a second fixed mode,

a spread-spectrum modulator, responsive to said first fixed mode of said mode controller, for generating a spread-spectrum signal, and

a narrowband modulator, responsive to said second fixed mode of said mode controller, for generating a narrowband signal wherein one of said narrowband signal and said spread spectrum signal is transmitted in a cellular region, and the other of said narrowband signal and said spread spectrum signal is transmitted in a microcellular region.

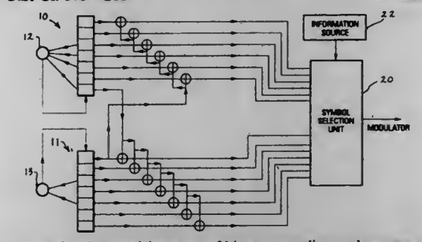


5,815,526

SIGNAL COMPRISING BINARY SPREADING-CODE SEQUENCES

Bart F. Rice, Santa Cruz, Calif., assignor to Lockheed Martin Corporation, Bethesda, Md.

Division of Ser. No. 100,334, Jul. 30, 1993, Pat. No. 5,452,328, which is a continuation of Ser. No. 917,873, Jul. 23, 1992, abandoned, which is a division of Ser. No. 766,372, Sep. 27, 1991, Pat. No. 5,210,770. This application May 31, 1995, Ser. No. 456,077
Int. Cl.[6] H04B *1/707*
U.S. Cl. 375—206 **2 Claims**



1. A signal comprising a set of binary spreading-code sequences modulated onto a sinusoidal carrier, said set of binary spreading-code sequences being produced by a process of simultaneously:

a) combining contents of a single stage of a first multi-stage binary shift register with contents of each stage of a plurality of stages of a second multi-stage binary shift register, the contents of each stage of each of said first and second binary shift registers having a period of (2^n-1), where n is a fixed integer having the same value for each of said first and second binary shift registers, the contents of said stages of said first and second binary shift registers being combined by modulo-2 addition to produce a first subset of combined spreading-code sequences, and

b) combining contents of a single stage of said second binary shift register with contents of each stage of a plurality of stages of said first binary shift register by modulo-2 addition to produce a second subset of combined spreading-code sequences,

said first and second subsets of combined spreading-code sequences having cross-correlation properties as follows:

(i) a cross-correlation between any two of said combined binary spreading-code sequences over any contiguous (2^n-1) bits has a magnitude

$$\leqq (2^{[(n+1)/2]}+1),$$

where $[(n+1)/2]$ denotes the greatest integer $\leqq (n+1)/2$; and

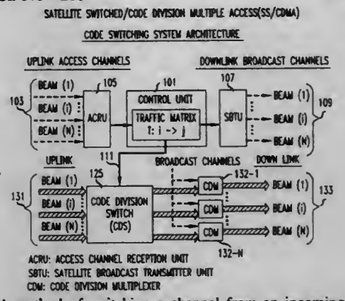
(ii) a cross-correlation at zero offset between any two of said combined binary spreading-code sequences in either one of said first and second subsets has a magnitude equal to one.

5,815,527

METHOD AND APPARATUS FOR SWITCHING SPREAD SPECTRUM/CODE DIVISION MULTIPLE ACCESS MODULATED BEAMS

Richard Henry Erving, 3 Overbrook Rd., Piscataway, N.J. 08854, and Diakoumis Parissis Gerakoulis, 135 Oak St., Dover, N.J. 07801

Filed Apr. 23, 1996, Ser. No. 635,163
Int. Cl.[6] H04J *13/04;* **H04L** *12/00;* **H04B** *1/707;7/216*
U.S. Cl. 375—206 **11 Claims**



1. A method of switching a channel from an incoming spread spectrum beam to an outgoing spread spectrum beam, comprising the steps of:

coding each channel in the incoming spread spectrum beam in a manner to enhance channel separation and reduce interference between individual channels contained within the beams and recovering individual traffic channels by application of a user-specific pseudo random beam code;

summing all recovered traffic channels onto an overspread bus;

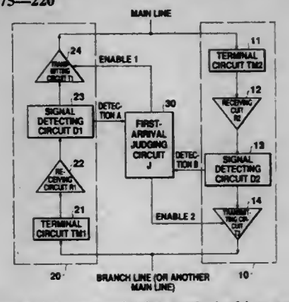
directing and combining recovered individual traffic channels from the overspread bus into outgoing spread spectrum beams, each having a destination in common with the traffic channels it contains.

5,815,528

INTERACTIVE COMMUNICATION CIRCUIT FOR SELECTING A TRANSMITTING CIRCUIT TO GENERATE SIGNALS

Susumu Koga, Saga-ken; Hidetoshi Takano, Toyota; Noriyuki Takao, Toyota; Kiyoshi Mizuno, Toyota, and Goro Kobayashi, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Daiden Co. Ltd., Kurume, both of Japan

Filed Jul. 24, 1995, Ser. No. 505,959
Claims priority, application Japan, Aug. 26, 1994, 6-202398
Int. Cl.[6] H04B *3/02;* **G06F** *13/362*
U.S. Cl. 375—220 **5 Claims**



5. An interactive communication method of interactively communicating by connecting a first communication circuit and a second communication circuit, comprising a first transmission line

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for transmitting first signals from said first communication circuit to said second communication circuit and a second transmission line for transmitting second signals from said second communication circuit to said first communication circuit, which method includes the steps of,

detecting a difference between an output signal in said second transmission line and a summation signal of an input signal in said first transmission line and the output signal in said second transmission line, on an input of said first transmission line, and

detecting a difference between the output signal in said first transmission line and a summation signal of an input signal in said second transmission line and the output signal in said first transmission line, on an input of said second transmission line,

whereby the first signals from said first communication circuit are transmitted to said second communication circuit by way of said first transmission line, and the second signals from said second communication circuit are transmitted to said first communication circuit by way of said second transmission line.

5,815,529

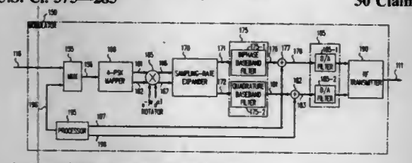
TRANSMISSION SYSTEM FOR DIGITAL AUDIO BROADCASTING THAT INCORPORATES A ROTATOR IN THE TRANSMITTER

Jin-Der Wang, Ocean, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 4, 1996, Ser. No. 628,219

Int. Cl.[6] H04B *15/00;* **H04L** *27/18*

U.S. Cl. 375—285 **30 Claims**



1. A receiver apparatus comprising:

a radio-frequency down-converter operative on a received radio-frequency signal to provide an intermediate-frequency signal; and

an intermediate-frequency down-converter for providing a pass-band signal from the intermediate-frequency signal such that the pass-band signal is centered about a first frequency selected to match a rotation frequency of a rotator within a corresponding transmitter of the received radio-frequency signal, the rotator used to map a first baseband signal to a second baseband signal having more constellation points than the first baseband signal.

5,815,530

DATA CONVERTERS FOR SOUND EQUIPMENT

Jun Hirai, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 23, 1996, Ser. No. 685,151

Claims priority, application Japan, Jul. 25, 1995, 7-188741

Int. Cl.[6] H04B *14/06;* **H04M** *3/00;1/12;* **H04J** *3/16*

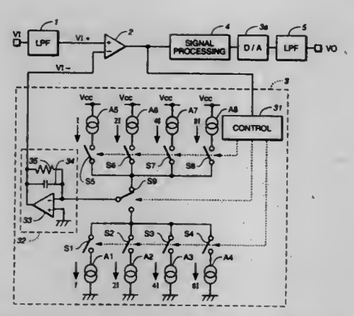
U.S. Cl. 375—247 **4 Claims**

1. A delta modulation type data converter adapted to compare an inputted analog signal with a reference voltage in cycles and to output a continuously varying digital signal, said data converter comprising:

a plurality of current sources;

switch circuits for setting a current value by appropriately selecting one or more of said current sources;

an integrator circuit for generating said reference voltage according to a specified current value; and



a control circuit for controlling said switch circuits to make an appropriate selection of said current sources according to the result of a comparison between said reference voltage and said inputted analog signal, said control circuit controlling said switch circuits such that:

if the result of said comparison is the same as the result of said comparison in the previous cycle, a selection from said current sources is made such that said current value is increased, provided such selection is possible;

if the result of said comparison is inverted from the previous cycle, a selection from said current sources is made such that the current direction with respect to said integrator circuit is reversed; and

if the result of said comparison is inverted repeatedly for a specified plural number of cycles, a selection from said current sources is made such that the current direction with respect to said integrator circuit is reversed and the associated current value is reduced, provided such selection is possible.

5,815,531

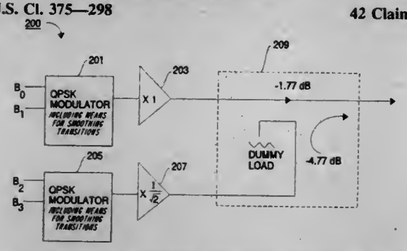
TRANSMITTER FOR ENCODED DATA BITS

Paul W. Dent, Pittsboro, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jun. 12, 1996, Ser. No. 662,940

Int. Cl.[6] H04L *27/36*

U.S. Cl. 375—298 **42 Claims**



1. A transmitter for generating Quadrature Amplitude Modulated signals from data bits, the transmitter comprising:

first Quadrature Phase Shift Keying (QPSK) means for encoding a first pair of the data bits into one of four carrier signal phases, thereby producing a first QPSK signal;

second QPSK means for encoding a second pair of the data bits into one of four carrier signal phases, thereby producing a second QPSK signal;

a first power amplifier for amplifying the first QPSK signal to a first power level and supplying a first amplified signal at an output of the first power amplifier;

a second power amplifier for amplifying the second QPSK signal to a second power level and supplying a second amplified signal at an output of the second power amplifier; and

combining means for combining the first and second amplified signals to produce a signal in which four data bits are encoded.

5,815,532

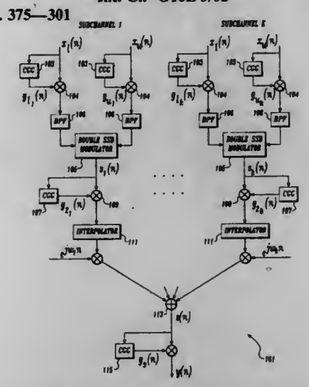
METHOD AND APPARATUS FOR PEAK-TO-AVERAGE RATIO CONTROL IN AN AMPLITUDE MODULATION PAGING TRANSMITTER

Bhaskar Bhattacharya, Port Coquitlam; Patricia Fern Kavanagh, and Mohammad Aamir Husain, both of Burnaby, all of Canada, assignors to Glenayre Electronics, Inc., Charlotte, N.C.

Filed May 1, 1996, Ser. No. 640,719

Int. Cl.[6] G10L *3/02*

U.S. Cl. 375—301 **18 Claims**



1. A method for reducing the peak-to-average power ratio of a plurality of amplitude modulated voice signals for broadcast by a paging transmitter, the method comprising the steps of:

(a) calculating an associated first gain sequence for each of said plurality of voice signals, said associated first gain sequence dependent upon the corresponding voice signal;

(b) for each of said plurality of voice signals, multiplying the voice signal with said associated first gain sequence to provide a first compressed voice signal;

(c) modulating at least one pair of said first compressed voice signal to produce at least one independent single sideband signal;

(d) calculating a second gain sequence for each of said at least independent single sideband signals;

(e) multiplying said second gain sequence with said independent single sideband signal to form at least one second compressed voice signal; and

(f) multiplying each of said second compressed voice signals with an assigned predetermined carrier frequency to provide an output signal for broadcast.

5,815,533

RECEIVE PROCESSOR DEVICE FOR USE IN A DIGITAL MOBILE RADIO SYSTEMS

Christophe Mourot, Asnieres, France, assignor to Alcatel Mobile Communication France, Paris, France

Filed Apr. 5, 1995, Ser. No. 416,975

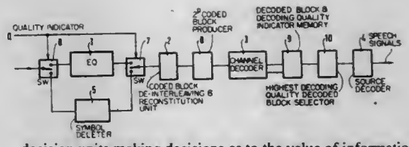
Claims priority, application France, Apr. 11, 1994, 94 04230

Int. Cl.[6] H03K *9/00;* **H04L** *27/06;27/14;27/22*

U.S. Cl. 375—316 **15 Claims**

1. A receive processor device for use in a digital mobile radio system, the device including:

a processor chain comprising a set of units connected in cascade, one or more of said units being decision units, each of said



decision units making decisions as to the value of information symbols received by said each decision unit;

means for bypassing one of said decision units and for deleting the value of information symbols to be processed by a succeeding unit connected in cascade with said one of said decision units, if the transmission quality of information symbols received by said one of said decision units is poor; and

means for determining probable values for information symbols deleted by said means for bypassing, based on said deleted information symbols and based on information symbols not deleted by said means for bypassing.

5,815,534

DETECTOR OF CARRIER LOSS IN A FAX MODEM

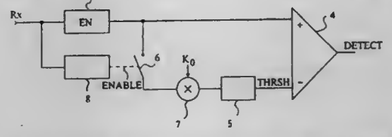
William Glass, Seyssinet Pariset, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Sep. 12, 1995, Ser. No. 527,055

Claims priority, application France, Sep. 14, 1994, 94 11212

Int. Cl.[6] H04L *27/14;27/16;27/22*

U.S. Cl. 375—326 **38 Claims**



1. A carrier loss detector in a modem receiving digitized facsimile transmissions of a document having a plurality of pages, comprising:

a first magnitude calculation circuit receiving a transmission signal and generating a first magnitude value of the transmission signal;

a first comparator receiving said first magnitude value of the transmission signal and a threshold value and outputting a carrier loss signal when the threshold value is greater than the first magnitude value; and

a threshold adjusting means for adjusting said threshold value between each page of the transmitted document.

5,815,535

CARRIER RECOVERY APPARATUS

Yang-seok Choi, Seoul, and Jang-jin Choi, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Apr. 9, 1997, Ser. No. 831,649

Claims priority, application Rep. of Korea, Apr. 10, 1996, 96-10860

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—344 **12 Claims**

1. A carrier recovery apparatus for recovering a carrier from an input signal, comprising:

a multiplier, coupled to receive said input signal, and operative to multiply said input signal by a frequency signal to produce a multiplied input signal;

a matched filter, coupled to an output of said multiplier to receive said multiplied input signal, and operative to match and filter said multiplied input signal, to produce a filtered signal;

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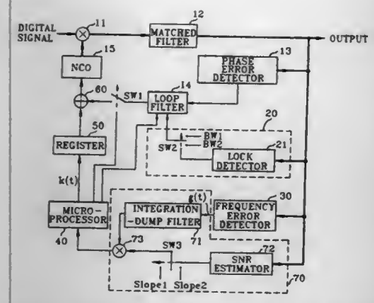


a phase error detector, coupled to an output of said matched filter to receive said filtered signal, and operative to detect a phase error in said filtered signal, to produce a phase error signal;

a loop filter, coupled to an output of said phase error detector to receive said phase error signal, and operative to remove noise from said phase error signal;

bandwidth varying circuit, coupled to an output of said matched filter to receive said filtered signal, and varying the bandwidth of said loop filter according to whether said filtered signal is phase-locked;

a frequency error detector, coupled to an output of said matched filter to receive said filtered signal, and detecting a frequency error in said filtered signal;

an adder, coupled to an output of said frequency error detector and selectively coupled to an output of said loop filter, said adder adding an input sweep signal based on an output of said frequency error detector to an output of said loop filter, to produce a frequency control signal; and

a numerically controlled oscillator (NCO), coupled to an output of said adder for receiving said frequency control signal, and producing said frequency signal.

5,815,536

MULTIVALUE DIGITAL TRANSMISSION SYSTEM

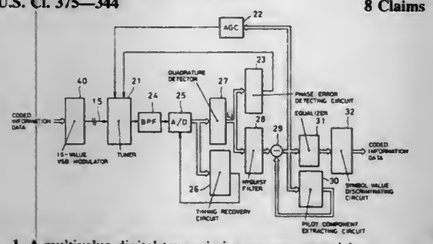
Yoshinori Abe, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 14, 1997, Ser. No. 856,483

Claims priority, application Japan, May 17, 1996, 8-123707

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—344 **8 Claims**



1. A multivalue digital transmission system comprising:

a multivalue modulator which converts information data to be transmitted into a multivalue symbol sequence consisting of multivalue symbols, adds a binary symbol area consisting of binary symbols to the multivalue symbol sequence in a periodic manner, and obtains a multivalue digital modulation signal by executing a multivalue digital modulation to a signal obtained by adding the binary symbol area to the multivalue symbol sequence;

a tuner for converting the multivalue digital modulation signal into an Intermediate Frequency (IF) signal at a gain according to an Automatic Gain Control (AGC) signal;

a demodulator for demodulating the IF signal by a demodulation process corresponding to the multivalue digital modulation to produce a demodulation signal;

an AGC circuit for detecting the binary symbol area from the demodulation signal and for producing the AGC signal based on a signal level of the demodulation signal obtained during a period of detection of the binary symbol area; and

pilot signal eliminating means including:

polarity detection means for detecting a polarity of the demodulating signal and producing a multiplication coefficient which has a value of "1" when the demodulation signal has a positive polarity and a value of "−1" when the demodulating signal has a negative polarity;

binary symbol area stabilization detecting means for determining if the binary symbol area is obtained stably;

binary symbol area detection means for detecting the binary symbol area from the demodulation signal;

means for producing, as a superposed pilot signal, the demodulation signal obtained during a detection period of the binary symbol when the binary symbol area is not obtained stably and producing, as the superposed pilot signal, a signal obtained by subtracting a product of the multiplication coefficient and an absolute value of the binary symbol from the demodulation signal when the binary symbol area is obtained stably;

an accumulating adder for accumulatively adding the superposed pilot signal and producing a pilot component signal; and

a subtractor for subtracting the superposed pilot signal from the demodulation signal.

5,815,537

WIRELESS DIGITAL COMMUNICATION DEVICE, AND A PULSE SHAPING NETWORK

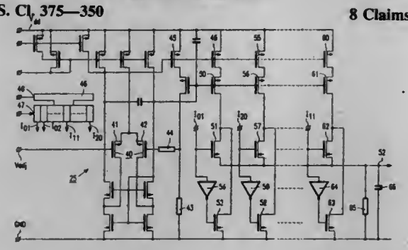
Daniel J. G. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1996, Ser. No. 683,327

Claims priority, application European Pat. Off., Jul. 21, 1995, 95202009

Int. Cl.[6] H04B *1/10*

U.S. Cl. 375—350 **8 Claims**



1. A wireless digital communication device comprising: a modulator for modulating digital signals, the modulator being preceded by a pulse shaping network for pulse shaping the digital signals, characterized in that the pulse shaping network comprises a differential amplifier having a first input to which a discretely adjustable voltage can be fed, and having a second input coupled to a first terminal of a resistor which has a second terminal coupled to a first supply terminal, the second input also being coupled to a first terminal of a current source which has a second terminal coupled to a second supply terminal, and in that the pulse shaping network further comprises a weighted-current network, the current source being mirrored into current sources of the weighted-current network.

5,815,538

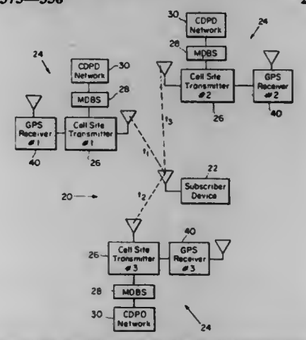
METHOD AND APPARATUS FOR DETERMINING LOCATION OF A SUBSCRIBER DEVICE IN A WIRELESS CELLULAR COMMUNICATIONS SYSTEM

Conrad Grell, San Diego; Jeremy Guralnick, Encinitas; Ilan J. Rothmuller, San Diego; Chris Bennett, San Diego, and Michael Theiss-Aird, Carlsbad, all of Calif., assignors to Omniplex, Inc., San Diego, Calif.

Continuation of Ser. No. 83,643, Jun. 25, 1993. This application Jan. 11, 1996, Ser. No. 585,261

Int. Cl.[6] H04B *7/185;* **G06F** *15/20*

U.S. Cl. 375—356 **24 Claims**



1. A method for determining a location of a subscriber device in a wireless cellular communications system, comprising the steps of:

providing a subscriber device having a cellular digital data receiver system with a cellular digital data receiver therein;

transmitting cellular digital data signals to the subscriber device from at least three different cellular cell site transmitters at different but known locations, each data signal containing a time-synchronized synchronization signal, the time-synchronized synchronization signals of the at least three different cellular cell site transmitters being transmitted at the same time or being displaced in time from each other by a known time displacement;

informing the subscriber device of location data representing a location of each of the at least three cellular cell site transmitters;

determining a time of arrival of each of the time-synchronized synchronization signals with respect to an internal clock of the cellular digital data receiver system; and

obtaining the location of the subscriber device from the location data and the times of arrival of the time-synchronized synchronization signals relative to the internal clock.

5,815,539

SIGNAL TIMING SYNCHRONIZER

Gary R. Lennen, Cupertino, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

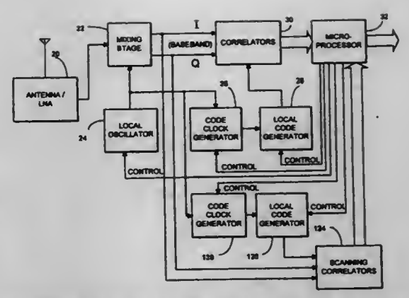
Continuation of Ser. No. 409,875, Mar. 24, 1995, abandoned, which is a continuation of Ser. No. 823,980, Jan. 22, 1992, Pat. No. 5,402,450. This application Jul. 12, 1996, Ser. No. 679,627

Int. Cl.[6] H04L *7/00;25/36;25/40*

U.S. Cl. 375—371 **17 Claims**

1. A method of synchronizing to a reference signal the timing of a received composite signal consisting of a preferred, interference-free signal distorted by at least one interfering signal, to determine an undistorted timing of the preferred signal, the method comprising the steps of:

generating points on a correlation function representative of a timing relationship between the distorted composite signal and the reference signal;



determining a nominal peak amplitude and the location in time of the nominal peak amplitude of said correlation function;

determining the location in time and amplitude of a first point that is displaced from said nominal peak on said correlation function relative to said nominal peak;

determining the location in time and amplitude of a second point that is displaced from said first point;

determining a displacement of said first point relative to said second point; and

identifying said displacement with the displacement in time required to synchronize the timing of the reference signal to said received composite signal.

5,815,540

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING PLL CIRCUIT

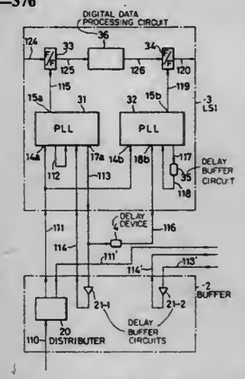
Yasushi Aoki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 253,062, Jun. 2, 1994. This application Jun. 6, 1995, Ser. No. 466,459

Claims priority, application Japan, Jun. 2, 1993, 5-156297

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **6 Claims**



1. A semiconductor integrated circuit device comprising:

a first register for storing an input data signal;

a second register for storing an output data signal;

a data-processing circuit block disposed between said first register and said second register;

a first phase-locked loop (PLL) circuit for supplying a first output clock signal to said first register in response to an input clock signal; and

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a second PLL circuit for supplying a second output clock signal to said second register in response to said input clock signal;

said first register transferring said input data signal stored therein to said data-processing circuit block in response to said first output clock signal;

said data-processing circuit block receiving to digitally process said input data signal from said first register and transferring said input data signal thus digitally-processed to said second register;

said second register receiving to store said input data signal digitally-processed from said data-processing circuit block and transferring said input data signal stored therein as said output data signal to another device in response to said second output clock signal;

said first PLL circuit receiving said input clock signal and supplying said first output clock signal to said first register while keeping a first phase difference between said input clock signal and said first output clock signal at a first constant; and

said second PLL circuit receiving said input clock signal and supplying said second output clock signal to said second register while keeping a second phase difference between said input clock signal and said second output clock signal at a second constant.

5,815,541

DIGITAL PHASE LOCKED LOOP ASSEMBLY

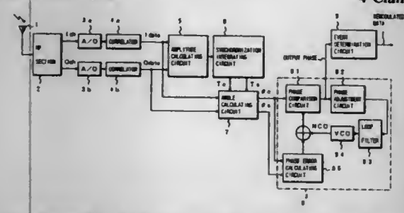
Mikio Fukushi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 9, 1996, Ser. No. 762,165

Claims priority, application Japan, Dec. 15, 1995, 7-327651

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **4 Claims**



1. A digital PLL apparatus comprising: synchronization integration circuit determining a symbol timing by obtaining a maximum amplitude point of a correlation level during reception of a preamble, an angle calculating circuit outputting a phase θc by performing an angle calculation for every symbol timing determined by said synchronization integrating circuit and outputting a phase θs by performing an angle calculation at a symbol timing point, and a digital PLL circuit receiving the phases θc and θs from said angle calculating circuit and operating a phase locked loop, and said digital PLL circuit integrates, L times, the phase θc at a symbol timing at a preceding maximum peak point and the phase θs at a symbol timing point to which the symbol timing is to be moved in an L-symbol interval until the symbol timing is moved, and adds an average value obtained by multiplying the integration result by 1/L to a numerical control oscillator in said digital PLL circuit when said synchronization integrating circuit shifts the symbol timing, thereby obtaining an output phase.

5,815,542

DEVICE FOR COLLECTING REACTOR-MELTDOWN PRODUCTS FROM A REACTOR PRESSURE VESSEL

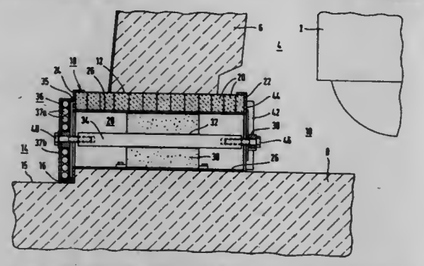
Lothar Wistuba, Herzogenaurach; Gerhard Hau, Albstadt, and Josef Hollmann, Schlüsselfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 8, 1995, Ser. No. 569,685

Claims priority, application Germany, Jun. 8, 1993, 43 19 093.6

Int. Cl.[6] G21C *9/016*

U.S. Cl. 376—280 **64 Claims**



1. A device for collecting reactor-meltdown products from a reactor pressure vessel, comprising:

a) an antechamber disposed below a reactor pressure vessel;

b) an expansion chamber having a floor forming an expansion surface for reactor-meltdown products; and

c) a bulkhead being disposed between said antechamber and said expansion chamber and being destructible by the reactor-meltdown products, said bulkhead having parts including at least one thermally destructible part being thermally destroyed by the reactor-meltdown products and including at least one other non-thermally destructible part supported by said at least one thermally destructible part until the reactor-meltdown products melt said at least one thermally destructible part for creating a flow path for the reactor-meltdown products from said antechamber into said expansion chamber upon thermal destruction of said at least one thermally destructible part resulting in the collapse of said at least one other non-thermally destructive part.

5,815,543

SEISMIC SUPPORT WITH CLEARANCE GAP AND YIELDABLE MEMBER

Sterling J. Weems, Chevy Chase, Md., and Thomas E. Greene, Alexandria, Va., assignors to MPR Associates, Inc., Alexandria, Va.

Filed Mar. 25, 1996, Ser. No. 621,498

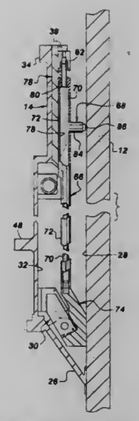
Int. Cl.[6] G21C *9/00*

U.S. Cl. 376—285 **14 Claims**

1. In a nuclear reactor including a reactor vessel and a core shroud disposed within the reactor vessel in laterally spaced relation, a seismic support comprising

a spacer extending between laterally opposed surfaces of said reactor vessel and said core shroud to limit lateral movement of said core shroud, said spacer having a configuration to deform substantially elastically in response to impacts caused by operating and design basis earthquakes relative to said reactor vessel; and

a deformable member carried by said spacer and having a configuration to deform substantially elastically in response to impacts caused by an operating basis earthquake and substantially plastically at relatively constant load in response to impacts caused by a design basis earthquake to limit the



maximum load on said core shroud to about that normally experienced during an operating basis earthquake.

5,815,544

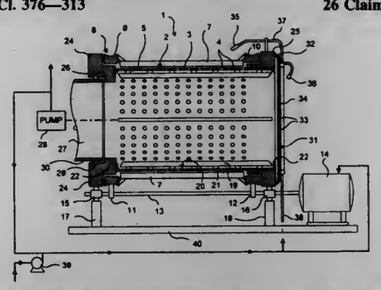
SELF-CLEANING STRAINER

Jan D. Lefter, 17-32 202nd St., Bayside, N.Y. 11360

Filed Feb. 20, 1997, Ser. No. 803,314

Int. Cl.[6] G21C *19/307*

U.S. Cl. 376—313 **26 Claims**



18. A method for providing cooling liquid to a nuclear reactor having a suppression pool comprising:

providing a pump having an inlet connected to the suppression pool and an outlet connected to spray means associated with the nuclear reactor;

placing a strainer in the suppression pool, the strainer connected to the pump inlet to prevent debris in the suppression pool from reaching the pump, the strainer having a wall provided with fluid inlet perforations, and having an outer surface upon which the debris collects, the strainer having a surface cleaner disposed relative to the outer surface;

moving the surface cleaner relative to the strainer so that the surface cleaner moves relatively over the outer surface to clean the outer surface by contacting and removing the debris; and

directing a jet of liquid against the cleaned outer surface to clean the perforations.

5,815,545

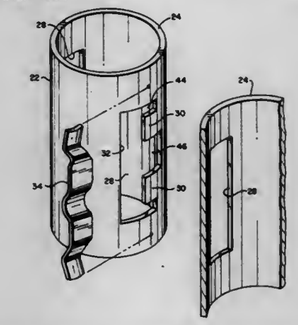
NUCLEAR FUEL ASSEMBLY SPACER AND SPRING

Eric B. Johansson, Prescott, Ariz., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 19, 1997, Ser. No. 802,559

Int. Cl.[6] G21C *3/34*

U.S. Cl. 376—442 **19 Claims**



1. A ferrule and spring combination for positioning at least one of a plurality of nuclear fuel rods in a spacer of a nuclear fuel bundle, comprising:

a generally cylindrical ferrule having an axis, a slot elongated in the direction of said axis and closed at opposite ends thereof, and a pair of tabs spaced axially from one another extending into said slot from an edge thereof and terminating short of an opposite edge of said slot to define axially spaced apertures along said slot;

an elongated spring having opposite ends engaging the long interior wall portions of the closed end portions of said ferrule between the respective opposite ends of said slot and ends of said ferrule;

said spring having flats located along said spring inwardly of said ends thereof for overlying said tabs outwardly of said ferrule and a projection located between said flats and projecting inwardly from said flats and through an aperture of said slot between said tabs for engaging a fuel rod disposed within the ferrule.

5,815,546

COMPUTED TOMOGRAPHY APPARATUS FOR CONDUCTING SPIRAL SCAN WITH THE X-RAY DETECTOR TILTED RELATIVE TO THE SYSTEM AXIS

Thomas Flohr, Uehlfeld; Klaus Klingenbeck-Regn, Nuernberg; Stefan Schaller, Erlangen, all of Germany, and Kwok Tam, Edison, N.J., assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 24, 1997, Ser. No. 881,331

Claims priority, application Germany, Jun. 28, 1996, 196 26 095.7

Int. Cl.[6] G01N *23/00*

U.S. Cl. 378—19 **3 Claims**

3. A method for operating a computed tomography apparatus comprising:

providing an X-ray radiator having a focus and providing a surface detector composed of a plurality of parallel lines of detector elements, said detector elements being symmetrically arranged relative to a symmetry axis;

means for conducting a spiral scan of a volume of an examination subject to obtain spiral scan data, by rotating said focus and said surface detector around a rotational axis around said examination subject while producing relative longitudinal motion between said focus and said surface detector, and said examination subject;

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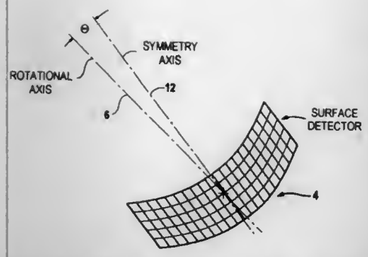


during said scan, tilting said surface detector at a non-zero acute angle between said symmetry axis and said rotational axis; and

producing a tomogram of said volume of said examination subject from said spiral scan data.

5,815,547

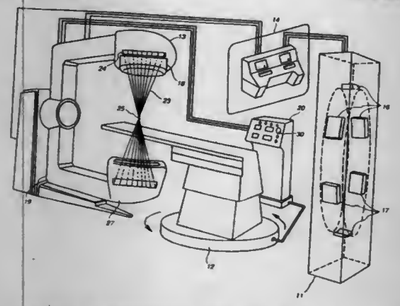
RADIATION THERAPY AND RADIATION SURGERY TREATMENT SYSTEM AND METHODS OF USE OF SAME

Joseph S. Shepherd, 2004 Le Droit Dr., South Pasadena, Calif. 91030, and Robert W. Rand, 521 N. Bristol Ave., Los Angeles, Calif. 90049

Division of Ser. No. 240,374, May 10, 1994, Pat. No. 5,537,452. This application Dec. 18, 1995, Ser. No. 574,155

Int. Cl.[6] A61N *5/10*

U.S. Cl. 378—65 **12 Claims**



1. A method for administering radiation to a patient comprising:

(a) executing treatment planning software on the central processing unit of a command and control center in order to determine a set of X,Y and Z radiation therapy target coordinates;

(b) providing three-dimensional visualization information to said central processing unit for use in determining said set of X,Y and Z radiation therapy target coordinates;

(c) providing treatment table position status to said central processing unit;

(d) performing both three-dimensional visualization and radiation therapy treatment without removing the patient from said treatment table; and

(e) catching the radiation from said radiation therapy in a radiation beam catcher.

5,815,548

PHOTOGRAPHING DEVICE AND X-RAY PHOTOGRAPHING SYSTEM UTILIZING THE SAME

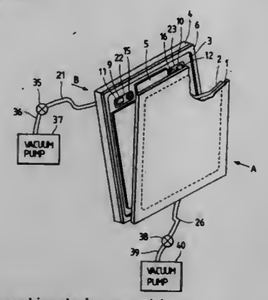
Kenichi Suzuki, Yokohama; Akira Tago, Kawasaki; Haruhisa Madate, Yokohama, and Masaaki Kobayashi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 13,219, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 663,420, Mar. 1, 1991, abandoned. This application Jun. 1, 1994, Ser. No. 252,536

Claims priority, application Japan, Mar. 2, 1990, 2-050855; Jan. 16, 1991, 3-003254

Int. Cl.[6] G03B *42/02*

U.S. Cl. 378—173 **11 Claims**



1. A photographing device comprising:

a pair of support members positioned in mutually opposed manner across a film;

a sensitivity increasing member mounted on at least one of said paired support members;

seal means for hermetically sealing a space containing said film and said sensitivity increasing member;

vacuum means for reducing the pressure in said sealed space at a photographing operation, thereby maintaining said film and said sensitivity increasing member in mutual close contact; and

holding means provided on at least one of said pair of support members for holding said film in a predetermined position between said support members in said sealed space,

wherein said holding means comprises means for holding the film by suction, and

wherein said holding means holds the film before the film is close to the sensitivity increasing member.

5,815,549

CATAPULT RASTER DRAWER FOR A RADIOLOGICAL EXAMINATION SYSTEM

Thomas Schmitt, Forchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 29, 1997, Ser. No. 902,216

Claims priority, application Germany, Aug. 1, 1996, 196 31 144.6

Int. Cl.[6] G03B *42/02*

U.S. Cl. 378—175 **6 Claims**

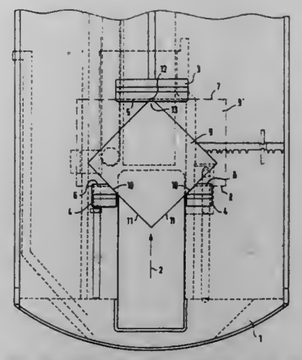
1. A catapult raster drawer for a radiological examination system, said drawer comprising:

an insertion carriage;

a first clamp jaw and a second clamp jaw disposed opposite each other on said insertion carriage;

means for resiliently displacing at least one of said first and second clamp jaws relative to the other of said clamp jaws for clamping a cassette between said first and second clamp jaws, said clamp jaws each having first stop faces oriented for holding a cassette therebetween in a first position with edges of said cassette parallel to said first stop faces; and

at least one of said first and second clamp jaws having a second stop face thereon, oriented at an angle relative to said first



stop face, for holding said cassette in a second position rotated by said angle relative to said first position.

5,815,550

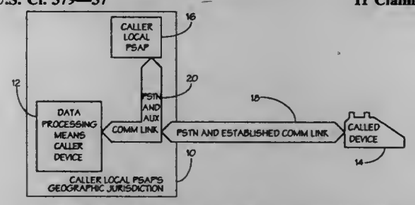
REMOTE CONFERENCE CALLING FOR WIRELINE SYSTEMS

S. Robert Miller, Mantua, N.J., assignor to Michael J. Ceglia, Cherry Hill, N.J.

Filed Sep. 20, 1996, Ser. No. 717,354

Int. Cl.[6] H04M *11/04*

U.S. Cl. 379—37 **11 Claims**



5. A system for improving the emergency aid response time to a first location comprising:

a wireline first telecommunications device at said first location and forming part of a public switched telecommunications network;

a second telecommunications device located at a second location remote from said first location and also forming a part of said public switched telecommunications network;

a third telecommunications device located at a third location remote from said first and second locations, said third telecommunications device also forming a part of said public switched telecommunications network;

sensor means and means responsive to said sensor means for causing said first device to establish a communications link with said second device in response to a predetermined sensed condition;

means for causing said first device to establish a communications link with said third device, and

means for establishing a conference call between said first, second and third devices, wherein said third telecommunications device is an emergency response device and wherein said means for causing said first device to establish communications with said emergency response device causes said first device to dial 9-1-1.

5,815,551

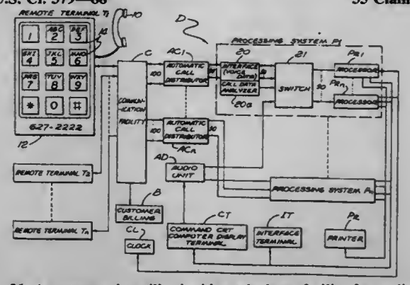
TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

Ronald A. Katz, Los Angeles, Calif., assignor to Ronald A. Katz Technology Licensing, LP, Los Angeles, Calif.

Continuation of Ser. No. 335,923, Apr. 10, 1989, which is a continuation of Ser. No. 194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 473,320

Int. Cl.[6] H04M *1/66;3/50;11/08*

U.S. Cl. 379—88 **35 Claims**



21. A system to be utilized with a telephone facility for on-line handling of customer data contained in a memory in accordance with a select operating format comprising:

a plurality of call distributors for routing calls wherein said plurality of call distributor are located at different geographic locations;

an operator terminal for use by a person to communicate through the telephone facility;

a plurality of interface switching structures located at different geographic locations and connected to the plurality of call distributors and the operator terminal for receiving incoming calls routed by said plurality of call distributors based on call allocation routing data and for receiving called terminal digital date (DNIS) signals automatically provided by the telephone facility to identify the select operating format from a plurality of operating formats; and

processing means connected to the plurality of interface switching structures for receiving customer number data entered by a caller and for storing the customer number data in a central memory accessed by said plurality of interface switching structures and based on a condition coupling an incoming call to the operator terminal, the processing means visually displaying the customer number data, the operator terminal providing other data entries to the central memory to update data relating to the caller.

5,815,552

CALLING PARTY DESIGNATED MESSAGE DISPLAYING METHOD AND APPARATUS

Kiyokazu Obtsuka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 31, 1996, Ser. No. 594,785

Claims priority, application Japan, Feb. 13, 1995, 7-024004

Int. Cl.[6] H04M *1/64*

U.S. Cl. 379—88 **11 Claims**

1. A calling party designated message displaying method for an exchange system which includes a plurality of subscriber terminals and an exchange for controlling, based on call control information from one of said subscriber terminals or a network, a call to another one of said subscriber terminals or said network, comprising the steps of:

registering a plurality of display messages in a corresponding relationship to respective message numbers in advance into said exchange, and then, upon communication,

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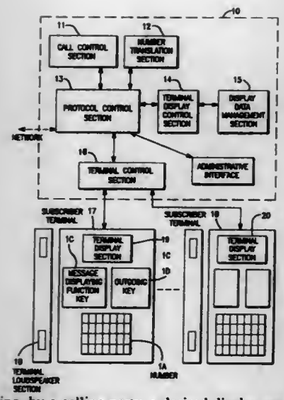


designating, by a calling party, a desired display message in the form of message number from one of said subscriber terminals,

reading out, by said exchange, based on the message number input from the subscriber terminal, data of the designated display message from among the registered display messages and transmitting the read out data of the designated display message back to the calling party terminal to request confirmation of the designated display message,

confirming the designated display message by the calling party in response to the request for confirmation,

designating and sending, after confirmation of contents of the designated display message by the calling party, the subscriber number of a called party terminal,

communicating, by said exchange, call control information with the read out data of the designated display message to the designated called party terminal, and

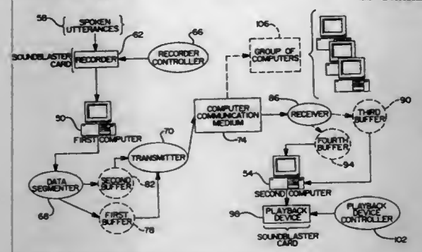
displaying, at the called party terminal, the designated display message based on the input data of the display message.

5,815,553

APPARATUS FOR VOICE COMMUNICATION OVER LOCAL AREA NETWORKS

Walter T. Baugh, Ellisville, Miss.; Desmond Morris, Huntsville, and Francis C. Wessling, III, Madison, both of Ala., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Oct. 2, 1996, Ser. No. 720,859
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—88 **11 Claims**



1. An apparatus for transmitting spoken utterances substantially in real time between a first computer and a second computer over a computer communication medium, said computer communication medium communicating digital data, said digital data including digitized voice data and non-spoken digital data, said first computer having a recorder for recording said spoken utterances, said second computer having a playback device for playing back said transmitted spoken utterances, the apparatus comprising:

a recorder controller coupled to said recorder for turning on and off said recorder to control the digital recording of said spoken utterances into digitized voice data by said recorder;

a data segmenter coupled to said recorder for segmenting said digitized voice data into a plurality of digital data segments of predetermined lengths;

a first buffer and a second buffer each responsive to said data segmenter for storing said digital data segments, said data segmenter causing said first buffer to be completely filled with a first digital data segment before filling said second buffer with a second digital data segment;

a transmitter coupled to said data segmenter and to said computer communication medium for transmitting said digital data segments between said first computer and said second computer over said computer communication medium, said transmitter transmitting said first digital data segment from said first buffer while said second buffer is being filled, and the contents of said second buffer while said first buffer is being filled;

a receiver coupled to said second computer and to said computer communication medium for receiving said transmitted digital data segments; and

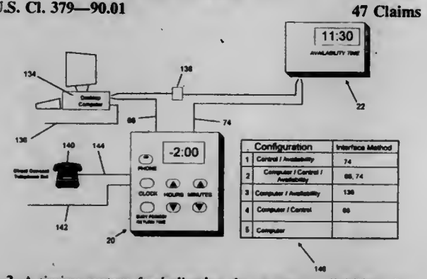
a playback controller coupled to said playback device for controlling the playing back of said transmitted spoken data segments, said playing back of said spoken data segments being substantially in real time from said transmitting of said spoken utterances.

5,815,554

METHOD AND SYSTEM FOR INDICATING OPERATOR AVAILABILITY

Ken L. Burgess, 707 Peterson St., Fort Collins, Colo. 80524, and Michael J. Lanning, 225 River North Dr. NW., Atlanta, Ga. 30328

Continuation of Ser. No. 449,392, May 24, 1995, abandoned. This application Feb. 25, 1997, Ser. No. 805,450
Int. Cl.[6] H04M *15/00*
U.S. Cl. 379—90.01 **47 Claims**



3. A timing system for indicating the present availability of an operator of the timing system to a potential visitor who desires to ascertain the present availability of the operator, the operator of the timing system having an office area which defines an area of personal workspace for the operator, the system comprising:

(a) an availability time indicator to indicate to the potential visitor via a visual display a time of day when the operator will become available to interact with the potential visitor so as to reduce interruptions of the operator, wherein the availability time indicator is adapted for locating immediately proximate to the office area of the operator so as to be viewable by the potential visitor when the potential visitor is located in proximity to the office area of the operator; and

(b) a controller associated with the availability time indicator to be used by the operator of the system to input a busy period, wherein the controller controls the availability time indicator and wherein the controller is adapted for locating separately from the availability time indicator so as to facilitate the input of the busy period and to facilitate the indicating to the potential visitor via the visual display the time of day when the operator will become available, wherein the controller comprises:

(b1) an entering device to enter the busy period;

(b2) a memory to store the busy period;

(b3) a clock to determine a present time of day when the operator inputs the busy period; and

(b4) a time calculator to calculate approximately the time of day when the operator will become available for display on the availability time indicator, wherein the time of day when the operator will become available is based on the present time of day and the busy period; and

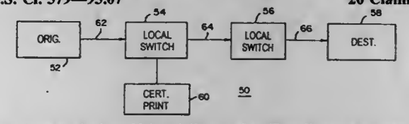
(c) at least one communications link from the controller to the availability time indicator to communicate the time of day when the operator will become available to the availability time indicator.

5,815,555

CERTIFIED TELEPHONIC TRANSMISSIONS

Jerry Cairo, Chicago, Ill., assignor to Matthew J. Cairo, Plant City, Fla.

Filed Feb. 11, 1997, Ser. No. 802,330
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—93.07 **20 Claims**



1. A method of certifying delivery of an E-mail message, transmitted through a telephonic network, such method comprising the steps of:

detecting a request for an E-mail certification from an originating computer to a destination computer by a certifying controller;

storing a copy of an E-mail transmission to the destination computer including the E-mail message and any associated message in the controller; and

certifying delivery of the E-mail transmission within the controller by matching a copy of at least one of the messages of the E-mail transmission received by the destination computer with the stored copy.

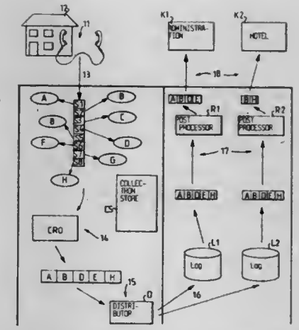
5,815,556

METHOD AND APPARATUS FOR EXTRACTING A SUBSET OF DATA WANTED BY A CUSTOMER FROM A GROUP OF SUBSETS OF DATA WANTED BY DIFFERENT CUSTOMERS

Erik M. Thuresson, Saltsjöbaden; A. Karolina Philippi, Stenhamra; E. Andreas Bartsch, and Carina M. Runefjord, both of Stockholm, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Sweden

Filed Dec. 2, 1994, Ser. No. 352,853
Claims priority, application Sweden, Dec. 3, 1993, 9304026
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—93.25 **40 Claims**

1. A method for extracting desired data in a data handling system where sets of data for repeated transactions are generated and different customers connected to the system want different subsets of the generated data, comprising the steps of: when data is generated, extracting only those data which belong to at least one of the subsets of data wanted by the different customers and storing the extracted data in a separate memory area arranged for each customer, the subset of data wanted by a customer then being extracted from this memory area.

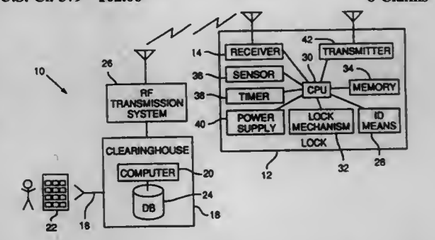


5,815,557

HOMEOWNER KEY FOR AN ELECTRONIC REAL ESTATE LOCKBOX SYSTEM

Wayne F. Larson, Salem, Oreg., assignor to SLC Technologies, Inc., Salem, Oreg.

Continuation-in-part of Ser. No. 819,345, Jan. 9, 1992. This application Jun. 7, 1995, Ser. No. 486,957
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—102.06 **8 Claims**



1. In a method of operating an electronic real estate lockbox system, the method including providing a house listed for sale with a lockbox, the lockbox containing a key to the house, compiling data relating to accesses of the lockbox in a lockbox memory, transferring data from the lockbox memory to a key associated with a real estate company, and transferring data from said key to a central database, an improvement comprising:

providing an owner of the house with an electronic key;

using the owner key to obtain data from the lockbox memory;

telephonically transferring the obtained data from the owner key to the central database by acoustically coupling the owner key to a telephone mouthpiece;

transmitting, by FAX, an interpreted report corresponding to said obtained data from the central database to a real estate company; and

voicing less than all of the obtained data to the owner over a telephone link using a voice synthesizer system in conjunction with the central database.

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5,815,558

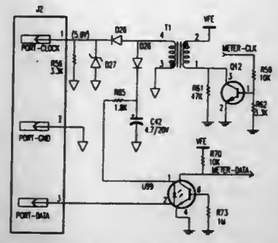
DIAL INBOUND METER INTERFACE UNIT WHICH USES TWO ELEMENTS FOR COUPLING TO AND ISOLATING FROM METER

Benjamin C. Bradley, Norcross, and Victor C. Trifu, Lilburn, both of Ga., assignors to Schlumberger, Norcross, Ga.

Filed Jul. 8, 1996, Ser. No. 677,621

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—106.04 **4 Claims**



1. An improved MIU of the type which is capable of retrieving data from a meter and transmitting such data to a central computer, the improvement being coupling and isolation circuitry for coupling power and timing signals from said MIU to said meter and data signals from said meter to said MIU while isolating said meter from said MIU, said coupling and isolation circuitry consisting of:

(a) a transformer for coupling both power and timing signals to said meter, said transformer having a first terminal which connects signals from said MIU to said meter; and

(b) a single optoisolator which receives data signals from said meter and couples said data signals to said MIU,

whereby said coupling and isolation circuitry is located between the MIU and the meter whose data is being coupled to said MIU, thereby providing power and data transfer between said MIU and said meter whose data is being coupled to said MIU while isolating said meter from said MIU.

5,815,559

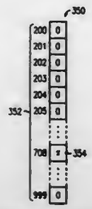
METHOD FOR SELECTING AMA RECORDS USING DIRECTORY NUMBERS

Andrew Thomas Schnable, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 426,304, Apr. 21, 1995. This application Aug. 28, 1997, Ser. No. 919,874

Int. Cl.[6] H04M *15/00*

U.S. Cl. 379—112 **3 Claims**



1. In an automatic message accounting (AMA) record distribution network, a method for processing AMA records, the method comprising the steps of:

initializing operation centers by storing a table of AMA structure codes and call-type codes in a database of the operation center;

receiving a substantially real time data stream of all AMA records in said operation centers from host collector sites;

determining upon receipt of an AMA record in at least one operation center whether the received AMA record is of interest to the operation center by performing a look-up of a number plan area (NPA) of a directory number contained in the AMA record in a data array stored in the operation center and by determining if an NPA entry in the data array which matches the NPA of the directory number has a pointer;

the operation center further processing only the AMA records selected to be of interest;

the operation center discarding the AMA records not selected to be of interest:

storing at least one bit map in a memory wherein the bit map identifies the AMA records selected to be of interest;

determining if a record received from the network corresponds to the bit map; and

responsive to determining that the record corresponds to the bit map, performing bill processing operations using the AMA record.

5,815,560

COMMUNICATION SERVICE CONTROL APPARATUS

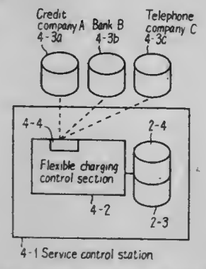
Sadayo Kasai; Yoshihiro Kawanabe, and Yoshikazu Takeda, all of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 7, 1995, Ser. No. 483,546

Claims priority, application Japan, Jun. 8, 1994, 6-126618; May 8, 1995, 7-109759

Int. Cl.[6] H04M *15/00;7/00*

U.S. Cl. 379—114 **12 Claims**



1. A communication service control apparatus for controlling the charging for tariff of communication services between subscribers, comprising:

information supply means for supplying charging control information including charging conditions about a plurality of customers for demanding said tariff of communication services;

charging decision means for deciding, based on said charging control information, to charge for a predetermined customer among said plural customers;

charging recording means for recording charging result information based on said charging decision means,

wherein said information supply means has a location information for identifying accommodation location of subscribers to which said communication services are offered and charging rule information for identifying charging rules in such a case that said desired accommodation location is decided as the initial point of charging;

while said charging decision means makes reference to said location information and said charging rule information, compares the charging rules with each other based on the accommodation locations of at least two or more said subscribers among those to which said communication services are offered and decides any one of said subscribers compared as the initial point of charging to minimize a total charge according to a result of comparing said charging rules.

5,815,561

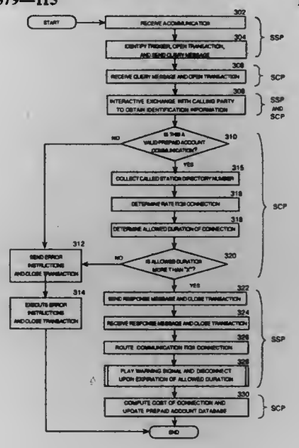
METHOD AND SYSTEM FOR PROVIDING A DEMARCATED COMMUNICATION SERVICE

Hong Nguyen, Atlanta, and Nallesh B. Desai, Norcross, both of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Filed Mar. 29, 1996, Ser. No. 626,247

Int. Cl.[6] H04M *15/00*

U.S. Cl. 379—115 **19 Claims**



4. In an intelligent switched telephone network including a first network element, a second network element, and a data link functionally connecting said first network element and said second network element, a method for providing a demarcated voice channel communication between an originating station and a called station, comprising the steps of:

receiving a communication at said first network element from said originating station, said communication having identification information associated therewith including a request that said communication be processed as said demarcated voice channel communication;

opening a transaction for use in a bi-directional exchange of messages relating to said communication between said first network element and said second network element:

causing said first network element to hold said communication at said first network element pending receipt of a message relating to said communication from said second network element;

causing said second network element

to determine a demarcation interval for said communication, and

to provide a demarcation message to said first network element, said demarcation message including said demarcation interval;

closing said transaction: and

after closing said transaction and in response to receiving said demarcation message, causing said first network element

to route said communication for connection to said called station, and

to play a demarcation signal to said communication upon expiration of said demarcation interval.

5,815,562

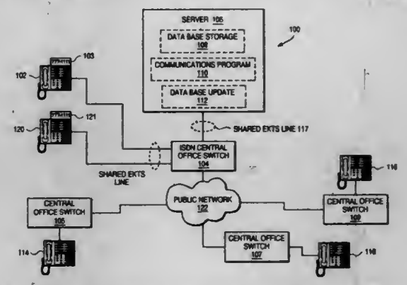
APPARATUS AND METHOD FOR PROVIDING A USER WITH ONE TELEPHONE NUMBER THAT RINGS PHONES ON HETEROGENEOUS SYSTEMS WORLDWIDE

David Iglehart; Leland Lester, both of Austin; Roger Bjork, Round Rock; Vedat Bilgutay, Austin, all of Tex.; Andrzej Koscinski, Mountain View, Calif., and Lee Rosenbaum, Boca Raton, Fla., assignors to Siemens Business Communication Systems, Inc., Santa Clara, Calif.

Filed Nov. 12, 1996, Ser. No. 747,466

Int. Cl.[6] H04M *3/46;3/56;1/00;7/00*

U.S. Cl. 379—211 **8 Claims**



8. A server for causing a worldwide telephone number associated with a local telephone connected to an integrated services digital network (ISDN) switch to be shared by one or more remote telephones, said local telephone and at least one of said remote telephones participating in electronic key telephone systems (EKTS) support, such that a call placed to said worldwide telephone number rings at said local telephone and at least one of said remote telephones, said server comprising:

means for receiving a notification of a telephone call from a calling telephone to said worldwide telephone number, said receiving means including means for receiving a signal specifying said worldwide telephone number; and

connecting means for connecting by conference call connection at least one of said local telephone or said remote telephones to said calling telephone depending on which of said local telephone and said remote telephones goes off hook first.

5,815,563

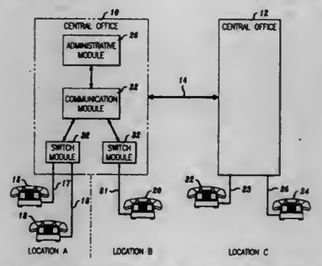
TELECOMMUNICATION SYSTEM WITH REMOTE CALL PICK-UP CAPABILITIES

Menachem Tsur Ardon, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 15, 1995, Ser. No. 572,955

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—210 **18 Claims**



1. A method for providing remote call pick up comprising the steps of:

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receiving a request for a call to a first analog consumer premises equipment (CPE);

reading a first record associated with the first CPE in a first database, said first record containing a directory number for a second analog CPE;

sending a standard ring pattern to said first CPE and causing a concurrent alternate ring pattern to be sent to said second CPE without establishing a call path to said second CPE, said alternate ring pattern signifying that the second CPE is not the original destination of call;

completing the call to the second CPE if a remote call pick up code is received from the second CPE before the first CPE goes off-hook, whereby remote call pick up at the second CPE is facilitated.

5,815,564

SYSTEM FOR CONNECTING AN INCOMING CALL TO A SELECTED ONE OF A NUMBER OF EXTENSIONS

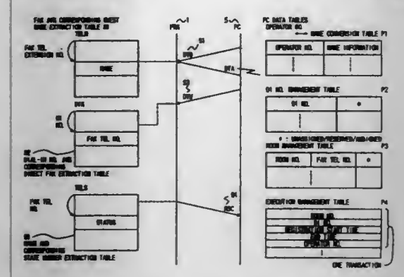
Takuo Tsuzuki, Hiratsuka; Masahiro Kumon, Yokohama; Yoshiharu Kondoh, Yokohama; Mitsuhiro Kotake, Yokohama, and Masayuki Hashimura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo; Hitachi Software Engineering Co., Ltd., and Hitachi Communication Systems, Inc., both of Kanagawa-Ken, all of Japan

Continuation of Ser. No. 559,459, Nov. 15, 1995, Pat. No. 5,563,940, which is a continuation of Ser. No. 74,482, Jun. 11, 1993, Pat. No. 5,541,992. This application Jul. 19, 1996, Ser. No. 684,216

Claims priority, application Japan, Jun. 11, 1992, 4-152428

Int. Cl.[6] H04M *3/00*

U.S. Cl. 379—233 **3 Claims**



1. A system for interactively registering a user being provided a service of a telephone exchange to directly connect a dialed in telephone call identified by a specific dialed-in number to a specific telephone terminal from among a plurality of telephone terminals, said system comprising:

an output device which outputs quidance information about inputting a request to use the specific telephone terminal and a room user identification indication corresponding to the specific telephone terminal;

an acceptance device which accepts the inputted request and the room user identification indication; and

an assignment processor which responds to acceptance of request by said acceptance device by temporarily assigning one of a plurality of specific dialed-in numbers to the specific telephone terminal in accordance with the accepted room user identification indication; wherein:

the plurality of telephone terminals are not associated with dialed-in numbers until said assignment processor temporarily assigns a dialed-in number to a telephone terminal;

said acceptance device is adapted to accept a cancellation time for the temporary assignment; and

said assignment processor further responds to acceptance of the cancellation time by said acceptance device by canceling the assignment at the accepted cancellation time.

5,815,565

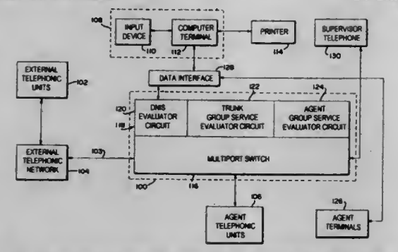
SERVICE EVALUATION SYSTEM AND METHOD FOR A TELEPHONIC SWITCH

Lonnie Doremus, Schaumburg; Wayne L. Harbuziuk, Wheaton, and David L. Blaha, Aurora, all of Ill., assignors to Rockwell International Corporation, Costa Mesa, Calif.

Filed Sep. 28, 1995, Ser. No. 535,431

Int. Cl.[6] H04M *3/22*

U.S. Cl. 379—265 **14 Claims**



11. A service evaluator system for evaluating incoming telephone calls received by an automatic call distributor from an external public switched telephone network and routed by a telephonic switch of the automatic call distributor to agents, the system comprising:

a dialed number identification service evaluator circuit for collecting dialed number identification service digits received with the incoming telephone calls from the external public switched telephone network, for selecting dialed number identification service digits corresponding to incoming telephone calls desired to be evaluated, and for connecting an evaluator to incoming telephone calls based on the collected dialed number identification service digits and the selected dialed number identification service digits;

a trunk group service evaluator circuit for selecting at least one trunk information group connected to the telephonic switch and for connecting the evaluator to incoming telephone calls received over the at least one selected trunk information group; and

an agent group service evaluator circuit for selecting at least one agent information group and for connecting the evaluator to incoming telephone calls routed to the at least one selected agent information group.

5,815,566

APPARATUS AND METHOD FOR DYNAMIC INBOUND/OUTBOUND CALL MANAGEMENT AND FOR SCHEDULING APPOINTMENTS

Danny Ramot, Fairfield, and Jeffrey L. Blamey, Wallingford, both of Conn., assignors to Executone Information Systems, Inc., Milford, Conn.

Continuation of Ser. No. 123,309, Sep. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 774,600, Oct. 10, 1991, Pat. No. 5,341,412. This application Oct. 16, 1996, Ser. No. 731,591

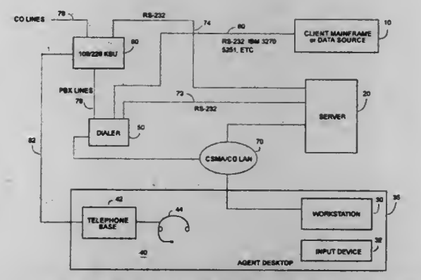
Int. Cl.[6] H04M *3/42;3/00;* **H04Q** *3/64*

U.S. Cl. 379—265 **17 Claims**

1. A telephone system providing appointment scheduling having a private branch exchange (PBX) for connecting a plurality of telephone stations to a telephone line, each of said telephone stations being assigned to one of a plurality of agents, the telephone system comprising:

a processing unit including:

associated memory and stored programs for storing appointment information, the appointment information including appointment entries having dates and times, for monitoring outbound and inbound calls and for storing therein a current status of each agent as being either an inbound agent or an outbound agent;



detecting means for detecting an inbound threshold condition signifying the need for redesignating in the memory an available outbound agent as an inbound agent for answering an inbound call;

notifying means for notifying the available outbound agent of the inbound call prior to redesignation;

redesignating means for redesignating in the memory the current status of the available outbound agent as an inbound agent; and

assigning means for assigning and connecting the available outbound agent having its current status redesignated in the memory as an inbound agent for answering the inbound call; and

each of the plurality of telephone stations including:

a voice communication device for facilitating voice communications by said respective one of said plurality of agents with an inbound or outbound call connected thereto through said telephone line;

a display;

an input device; and

a processor responsive to input signals representing commands for execution by said processor, including a call data command, a calendar command and an appointment command, from the respective input device, the processor responsive to the appointment command for generating and storing a plurality of appointment entries, the processor responsive to the calendar command for generating a calendar screen on the respective display of the respective telephone station and for generating and editing the appointment information in the associated memory, and the processor responsive to the call data command for displaying data relating to inbound and outbound calls originating from and connected to the respective agent.

5,815,567

COMMUNICATIONS INTERFACE PROVIDING ISOLATION AND RINGDOWN FEATURES

Jeffrey P. Davis, Ham Lake; Duane Francis Wald, Plymouth, and Timothy D. Gunn, Mounds View, all of Minn., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.

Filed May 31, 1996, Ser. No. 656,167

Int. Cl.[6] H04M *3/22*

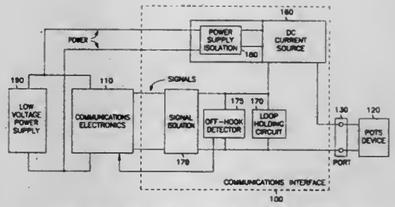
U.S. Cl. 379—377 **20 Claims**

1. A communications system, comprising:

communications electronics, connected to a signal isolation circuit;

a current source, connected to a low voltage power supply via power supply isolation circuit; and

a loop holding circuit and an off-hook detector, connected to a port, the loop holding circuit connected to the current source and to the signal isolation circuit and providing a holding current to a device connected to the port using current from the current source and providing a signal path between the



communication electronics and the device connected to the port.

5,815,568

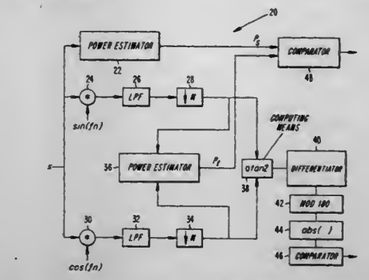
DISABLING TONE DETECTOR FOR NETWORK ECHO CANCELLER

Tönu Trump, Stockholm, Sweden, assignor to Telefoanktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 31, 1996, Ser. No. 594,584

Int. Cl.[6] H04J *15/00*

U.S. Cl. 379—386 **14 Claims**



1. A tone detector for controlling the operation of echo cancellers in a telephoning system, comprising:

means for determining a first power estimate of an input signal;

means for dividing said in-phase signal into phase and quadrature components;

means for subsampling said in-phase and quadrature components;

means for determining a second power estimate using said subsampled in-phase and quadrature components;

means for comparing said first and second power estimates to determine whether a predetermined tone is present;

means for detecting a phase reversal in said predetermined tone using said in-phase and quadrature components.

5,815,569

METHOD FOR CONTROLLING POWER LOSSES ASSOCIATED WITH LINE INTERFACE CIRCUITS IN TELECOMMUNICATIONS NETWORKS

Akhteruzzaman, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 27, 1996, Ser. No. 672,191

Int. Cl.[6] H04M *1/00;3/00;* **G05F** *1/40*

U.S. Cl. 379—399 **11 Claims**

5. A telecommunications line interface circuit interconnecting a subscriber line to a central office switch comprises:

a battery feed circuit for transmitting messages between customer premises equipment, and a main controller coupled between a DC power source and the battery feed circuit;

a switching converter circuit;

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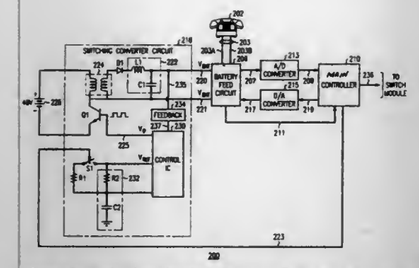


a frequency selection circuit coupled to the switching converter circuit for controlling whether the switching converter circuit operates at a first or second frequency; and

means for detecting an on-hook state of the subscriber line in order to operate the switching converter circuit at the first frequency which is lower than the second frequency used in response to detecting an off-hook state of the subscriber line.

5,815,570

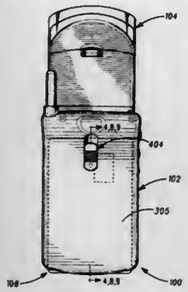
COMMUNICATION DEVICE WITH CARD EJECTION MECHANISM

John Francis Hannon, Gurnee, and Frank John Annerino, Rolling Meadows, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1995, Ser. No. 536,538

Int. Cl.[6] H04M *1/00;* **H04B** *1/00;1/38*

U.S. Cl. 379—428 **14 Claims**



13. A radiotelephone, comprising:

a radiotelephone housing, said radiotelephone housing having a front wall, side walls, top and bottom walls, a back wall opposite said front wall, and an opening in one of said top and bottom walls, said front wall having a display and a speaker positioned therein, and said opening for receipt of a card having information stored therein, said walls of said housing forming an enclosed volume;

a circuit board positioned in said radiotelephone housing enclosed volume between said front wall and said back wall of said housing, said circuit board having integrated circuitry positioned thereon, said opening providing sliding access for the card to be slid between said circuit board and said back wall when inserted through said opening in said one of said top and bottom walls;

a card reader element mounted on said circuit board with said integrated circuits, said card reader element to read information from the card and electrically coupled to said integrated circuitry to communicate the information from the card to said integrated circuitry; and

an ejection mechanism movably mounted on said back wall, said ejection mechanism including a resilient spring extending outwardly toward said card reader element to push the card against said card reader element and a button on an outside surface of said back wall, said resilient spring and button connected through said slot such that said eject mechanism slides in said slot when actuated by a user to eject the card by sliding it through said opening in said one of said top and bottom walls.

5,815,571

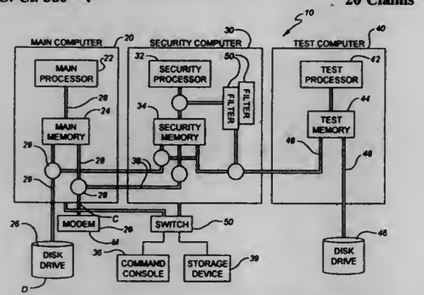
COMPUTER SYSTEM WITH SECURED DATA PATHS AND METHOD OF PROTECTION

Phillip Scott Finley, P.O. Box 40293, Eugene, Oreg. 97404

Filed Oct. 28, 1996, Ser. No. 734,840

Int. Cl.[6] G06F *12/14*

U.S. Cl. 380—4 **20 Claims**



1. A computer system with secured data paths, comprising:

(a) a main computer with a main processor, associated main memory, main input/output devices, and main internal data paths interconnecting the main processor, main memory, and main input/output devices;

(b) a security computer, distinct from the main computer and executing security programming distinct from the programming of the main computer, with a security processor, security memory, an operator console, and security data paths, the security computer being connected to the main internal data paths of the main computer so as to intercept all data flowing along the main data paths; and

(c) a test computer, distinct from the security computer with a test processor, test memory, test input/output devices, and test data paths, the test computer being connected to the security computer wherein the main processor executes user programs, the security processor executes security programs, and the test processor test-executes copies of user programs, the security computer examining all information flowing on the main internal data paths.

5,815,572

VIDEO SCRAMBLING

Gary Lamont Hobbs, Indianapolis, Ind., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 31, 1995, Ser. No. 522,624

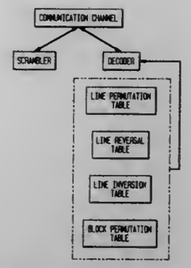
Int. Cl.[6] H04N *7/167*

U.S. Cl. 380—10 **10 Claims**

4. In the transmission of a video signal, the improvement comprising each of the following steps performed upon substantially all frames within the video signal:

i) inverting video lines;

ii) reversing video lines;



iii) permuting sequences of video lines; and

iv) permuting sequences of blocks of video lines.

5,815,573

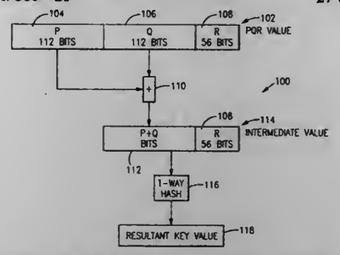
CRYPTOGRAPHIC KEY RECOVERY SYSTEM

Donald Byron Johnson, Pleasant Valley, N.Y.; Paul Ashley Karger, Acton; Charles William Kaufman, Jr., Northborough, both of Mass.; Stephen Michael Matyas, Jr., Poughkeepsie, N.Y.; Marcel Mordechay Yung, New York, N.Y., and Nevenko Zunic, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1996, Ser. No. 629,815

Int. Cl.[6] H04K *1/00*

U.S. Cl. 380—21 **27 Claims**



1. A method of generating a cryptographic key for use by a pair of communicating parties while providing for the recovery of said key using a plurality of cooperating key recovery agents, said method comprising the steps of:

generating a plurality of shared key parts that are shared with respective key recovery agents;

generating a nonshared key part that is not shared with any key recovery agent;

generating said key as a function of said shared key parts and said nonshared key part; and

making respective ones of said shared key parts available to said key recovery agents to facilitate said recovery of said key using said key recovery agents.

5,815,574

PROVISION OF SECURE ACCESS TO EXTERNAL RESOURCES FROM A DISTRIBUTED COMPUTING ENVIRONMENT

Michael S. Fortinsky, Netanya, Israel, assignor to International Business Machines Corporation, Armonk, N.Y.

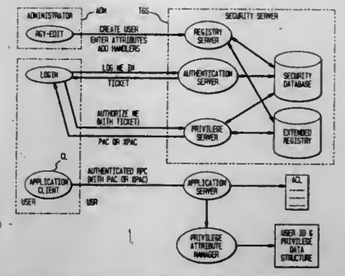
Filed Nov. 28, 1995, Ser. No. 563,692

Claims priority, application Canada, Dec. 15, 1994, 2138302

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—25 **4 Claims**

1. In a distributed computing environment having a security server that includes an attribute registry containing data concerning



client identities and attributes and client privileges in relation to resources within the distributed computing environment, the security server issuing a ticket on demand to a client within the distributed computing environment requiring service by an application server within the distributed computing environment, the ticket including a privilege attribute certificate containing encoded data which, on presentation to said application server, is decoded by said application server to provide information as to the client's identity and privilege attributes within the distributed computing environment, said distributed computing environment further comprising:

a gateway server within the distributed computing environment for providing access for clients within the distributed computing environment to a resource external to the distributed computing environment, the external resource having security requirements incompatible with those of the distributed computing environment;

an extended registry within the security server, the extended registry containing additional information as to client identities and privilege attributes with respect to said external resource, together with data as to the structure in which said external resource requires the additional information;

said security server automatically including said additional information as further encoded data in a ticket requested by a client for the gateway server; and

means within said gateway server for recognizing said further encoded data in said ticket, and for decoding said further encoded data and placing the additional information in a structure required for access to the external resource.

5,815,575

Patent Not Issued For This Number

5,815,576

Patent Not Issued For This Number

5,815,577

METHODS AND APPARATUS FOR SECURELY ENCRYPTING DATA IN CONJUNCTION WITH A PERSONAL COMPUTER

Dereck D. Clark, Phoenix, Ariz., assignor to Innovonics, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 609,273, Mar. 1, 1996, which is a continuation of Ser. No. 210,200, Mar. 18, 1994, Pat. No. 5,517,569. This application Mar. 24, 1997, Ser. No. 814,986

Int. Cl.[6] H04K *1/00;* **H04L** *17/02*

U.S. Cl. 380—52 **23 Claims**

1. A remote processing system, located at a first site, for interfacing with a host computer system located at a second site which is remote from said first site, the host computer system being of the

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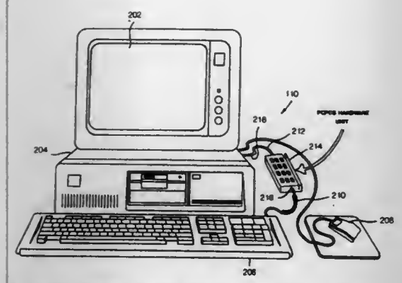


type which includes a host modem and which is configured to facilitate financial transactions upon receipt from said remote processing system of a data packet including an encrypted data field, said remote processing system comprising:

a. a PC, comprising:

(1) a first memory sector configured to store an interactive software program;

(2) a first processor configured to execute said software program;

(3) an input port configured to communicate with said first processor;

(4) a second modem configured to transmit said data packet from said PC to the host modem in accordance with said software program; and

(5) a PC monitor having a two-dimensional, multi-line display;

b. a PC keyboard and a second input device;

c. an encryption module, configured to communicate with said second input device, connected in series between said PC keyboard and said input port, comprising:

(1) an integral acquisition means;

(2) a second processor configured to selectively encrypt data entered into said integral acquisition means and said second input device; and

d. a data link configured to maintain communication between said encryption module and said PC input port.

5,815,578

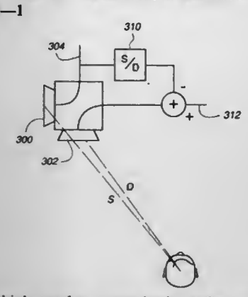
METHOD AND APPARATUS FOR CANCELING LEAKAGE FROM A SPEAKER

Scott H. Foster, Sunol, and Martin J. Walsh, Palo Alto, both of Calif., assignors to Aureal Semiconductor, Inc., Fremont, Calif.

Filed Jan. 17, 1997, Ser. No. 785,200

Int. Cl.[6] H04R *5/02;* **G10K** *11/16*

U.S. Cl. 381—1 **20 Claims**



1. In a multiple speaker system having a first speaker which is configured to transmit a reflected sound signal to a listener along a reflected path and a second speaker which is configured to transmit a direct sound signal to the listener at a location along a direct path, a method of reducing the listener's perception of a direct leakage signal from the first speaker including:

applying a first speaker input electrical signal to the first speaker, the first speaker being configured to be pointed in a direction away from the listener and having a direct leakage transfer function relative to the listener, the direct leakage transfer function being characterized by a transformation which transforms the first speaker input electrical signal into a first speaker leakage signal at the location of the listener by the radiation of the signal by the first speaker and the propagation of the radiated signal to the listener along a direct path from the first speaker to the listener;

processing a second electrical signal which is derived from the first speaker input electrical signal through an open loop system which has a leakage canceling transfer function, the leakage canceling transfer function being characterized by a transformation which transforms the second electrical signal into a canceling transmission signal which has the property of canceling the first speaker leakage signal at the location of the listener when the canceling transmission signal is transformed into a leakage canceling signal at the location of the listener as a result of being transmitted by the second speaker and propagated to the listener; and

applying the canceling transmission signal to the second speaker;

whereby the transmission and propagation of the of the canceling transmission signal from the second speaker to the listener tends to cancel the effect of the direct leakage transmission and propagation of the first input signal from the first speaker.

5,815,579

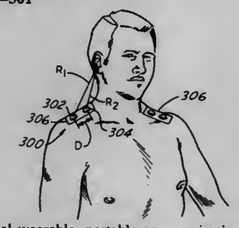
PORTABLE SPEAKERS WITH PHASED ARRAYS

James H. Boyden, Los Altos Hills, Calif., assignor to Interval Research Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 400,901, Mar. 8, 1995. This application Dec. 1, 1995, Ser. No. 565,951

Int. Cl.[6] H04R *5/02;25/00*

U.S. Cl. 381—301 **39 Claims**



1. A personal wearable, portable communication and entertainment system comprising:

a hollow, closed structural member;

a first transducer means mounted on said structural member;

second transducer means mounted on said structural member;

said first and second transducer means positioned in spaced relation to each other on said structural member;

driver means for driving said first and second transducer means with driving signals, said first and second transducer means being driven 180 degrees out-of-phase at a first frequency range and being driven in-phase at a second frequency range;

said first frequency range being lower than said second frequency range;

means for supplying audio signals to said first and second transducer means; and

means for changing the relative phase of driving signals from said driving means when the out-of-phase response would have been approximately the same as the in-phase response;

wherein each of said first and second transducer means, comprises a linear array of at least two speakers and wherein said system further comprises time-delay means which delays sending the audio signal to the speakers of each linear array of speakers in a preselected sequence;

whereby the response of said system in said first frequency range is enhanced.

5,815,580

COMPENSATING FILTERS

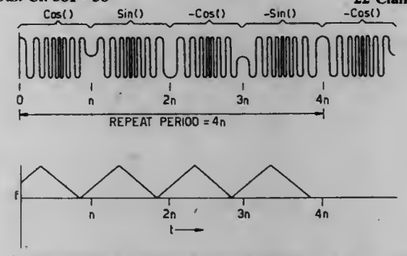
Peter G. Craven, Old School House, Main Street, East Challow, Wantage, Oxon, OX12 9SG, and Michael A. Gerzon, Ground Floor Flat, 14 Bartlemas Road, Oxford, OX4 1XX, both of United Kingdom

Division of Ser. No. 561,601, Nov. 21, 1995, Pat. No. 5,627,899, which is a division of Ser. No. 74,837, Aug. 3, 1993, Pat. No. 5,511,129. This application Feb. 18, 1997, Ser. No. 802,208

Claims priority, application United Kingdom, Dec. 11, 1990, 9026906; WIPO, Dec. 11, 1991, PCT/GB91/02200

Int. Cl.[6] H04R *29/00*

U.S. Cl. 381—58 **22 Claims**



1. Apparatus for generating an audio test signal comprising means (8) for generating a periodically repeating signal with a broad band frequency content and a periodically varying phase, in which the phase repetition period exceeds the signal repetition period.

5,815,581

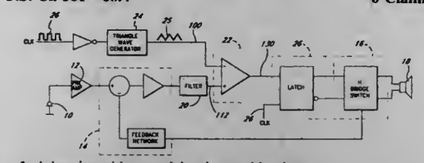
CLASS D HEARING AID AMPLIFIER WITH FEEDBACK

Olle Andersson, Jarfalla, Sweden, assignor to Mitel Semiconductor, Inc., San Diego, Calif.

Filed Oct. 19, 1995, Ser. No. 545,034

Int. Cl.[6] H04R *25/00*

U.S. Cl. 381—68.4 **6 Claims**



1. A hearing aid comprising in combination:

a battery having a negative terminal defining a circuit common V_{ss} and a positive terminal defining a first positive rail V_{bat};

a power supply circuit coupled to said battery defining a second positive rail V_{dd} which is higher than V_{bat};

an input transducer coupled to a pre-amplifier to produce an analog audio signal varying between V_{ss} and V_{dd}, thereby defining a first signal ground approximately midway between V_{ss} and V_{dd};

an output transducer;

a summing amplifier having first and second inputs and output, wherein said first input comprises said audio signal;

a pulse width modulation circuit having an input and an output, wherein said pulse width modulation circuit input is connected to said output of said summing amplifier, and wherein said pulse width modulation circuit output drives said output transducer with a pulsed voltage varying between V_{ss} and V_{bat} thereby defining a second signal ground approximately midway between V_{ss} and V_{bat}; and,

a feedback network having an input and an output, wherein said feedback network input is connected across said output transducer such that said feedback network input receives only said pulsed voltage, wherein said feedback network output is connected to said second input of said summing amplifier, and wherein said summing amplifier is configured to generate an error signal which is substantially independent of a difference between said first and second signal grounds.

5,815,582

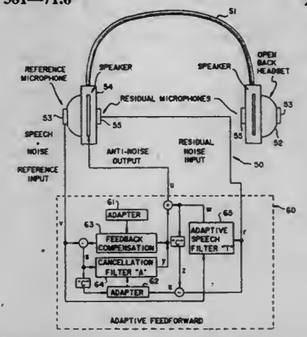
ACTIVE PLUS SELECTIVE HEADSET

David Claybaugh, Germantown; Jeffrey N. Denenberg, Trumbull; Ralph Busch, Takoma Park, and John Hohman, Towson, all of Md., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Continuation of Ser. No. 347,417, Dec. 2, 1994. This application Jul. 23, 1997, Ser. No. 899,090

Int. Cl.[6] A61F *11/06;* **H03B** *29/00*

U.S. Cl. 381—71.6 **20 Claims**



1. An active plus selective headset system which provides active broadband attenuation of noise as well as adaptive speech filtering, said system comprising:

a headset means adapted to be worn by a user;

reference sensing means on said headset means adapted to sense speech and noise signals;

speaker means on said headset means adapted to convey speech signals to a user's ear; and

controller means adapted to control the speaker means based on input from the reference sensing means to provide active broadband attenuation of all random inband noise as well as adaptive speech filtering so that only the speech reaches the ear, wherein said active broadband attenuation is accomplished without synchronization pulses.

5,815,583

AUDIO SERIAL DIGITAL INTERCONNECT

Gary A. Solomon, Hillsboro, and Russ K. Hampsten, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1996, Ser. No. 673,282

Int. Cl.[6] H04B *3/00*

U.S. Cl. 381—77 **21 Claims**

1. A method for communicating between two integrated circuits (IC's), the method comprising the steps of:

sending a sync signal between a first IC and a second IC, the sync signal indicating the beginning of the transmission of a frame of information between the first IC and the second IC;

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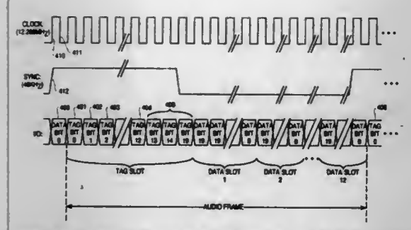


sending the frame of information between the first IC and the second IC, the frame of information comprising a tag slot preceding a plurality of data slots, wherein the tag slot comprises a plurality of tag bits, each of the tag bits indicating validity of data contained within a corresponding one of the plurality of data slots.

5,815,584

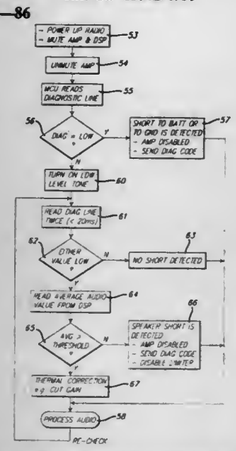
AUTOMATIC DETECTION OF SHORTED LOUDSPEAKERS IN AUTOMOTIVE AUDIO SYSTEMS

John Elliott Whitecar, and Andrew Cyril Krochmal, both of Plymouth, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1996, Ser. No. 745,768

Int. Cl.[6] H04B *1/00*

U.S. Cl. 381—86 **8 Claims**



1. A method of detecting improper connection of speakers in an automotive audio system including an audio processing unit providing an audio input to a power stage of a power amplifier, said method comprising the steps of:

operating said power amplifier in an unmuted condition;

muting said audio input;

checking whether said power stage is operating within a predetermined safe-operating-area;

indicating that a speaker is shorted to one of battery or ground if said power stage is not operating within said predetermined safe-operating-area;

providing a low level audio signal on said audio input;

checking whether said power stage is operating within said predetermined safe-operating-area; and

indicating that there is a short across a speaker if said power stage is not operating within said predetermined safe-operating-area.

5,815,585

ADAPTIVE ARRANGEMENT FOR CORRECTING THE TRANSFER CHARACTERISTIC OF AN ELECTRODYNAMIC TRANSDUCER WITHOUT ADDITIONAL SENSOR

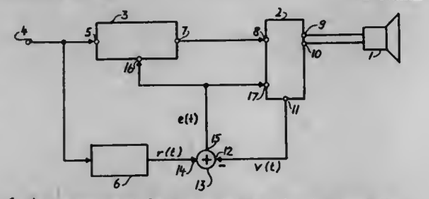
Wolfgang Klippel, 326 Longview Pl., Thousand Oaks, Calif. 91360

Filed Sep. 19, 1994, Ser. No. 308,357

Claims priority, application Germany, Oct. 6, 1993, 4334040

Int. Cl.[6] H04R *3/00*

U.S. Cl. 381—96 **12 Claims**



1. An arrangement for converting an electric signal into a mechanic or an acoustic signal using a transducer and an adaptive correction filter having a filter input, a filter output and a control input for compensating for distortions of said transducer and for realizing a desired transfer characteristic between the input of said correction filter and the output of said transducer and for adjusting said correction filter adaptively without using a mechanic or an acoustic sensor, comprising:

an adaptive detector circuit having a detector input connected to said filter output, two transducer outputs connected to the terminals of said transducer, an error input and a detector output for providing a motional signal related to the vibration of said transducer;

a reference filter having a reference input connected to said filter input, a reference output for providing a desired signal related to said desired transfer characteristic; and

a comparator having a first input connected to said detector output, a second input connected to said reference output and an output connected both to said control input and to said error input for providing an error signal for adjusting adaptively the parameters of both said correction filter and said detector circuit.

5,815,586

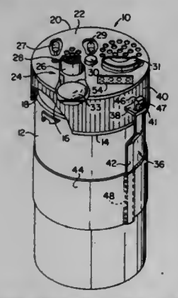
CLOSURE FOR SEALING A MEDICATION CONTAINER

John C. Dobbins, 323 Thistle Ln., Southington, Conn. 06489

Filed Nov. 13, 1996, Ser. No. 747,616

Int. Cl.[6] B05B *51/00;7/00;* **G08B** *3/10;* **G04C** *21/00*

U.S. Cl. 381—124 **20 Claims**



1. A reusable closure for sealing the top of a medication container comprising:

a recorder positioned within the reusable closure for recording verbal patient instructions for the proper use of the medication;

means for generating audio signals corresponding to the recorded instructions;

means for actuating the recorder and the audio signal generation means; and

retaining means slidably and releasably received by the closure at one end and coupled to the medication container at an opposite end for preventing the closure from being completely separated from the medication container.

5,815,587

LOUDSPEAKER WITH SHORT CIRCUIT RINGS AT THE VOICE COIL

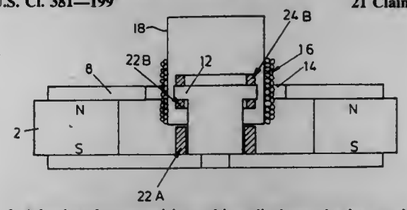
Lars Goller, Herning, Denmark, assignor to Scan-Speak A/S, Videbaek, Denmark

Continuation of Ser. No. 545,739, Nov. 7, 1995. This application Apr. 17, 1997, Ser. No. 843,964

Claims priority, application Denmark, May 10, 1993, 9549/93

Int. Cl.[6] H04R *25/00*

U.S. Cl. 381—199 **21 Claims**



1. A loudspeaker comprising a driver diaphragm having a voice coil and an associated magnet system including an annular air gap within which the voice coil locates, the voice coil being longer than the axial extension of the annular air gap, the magnet system including a central pole piece, the voice coil and central pole piece having a frontal end towards said driver diaphragm and a rearward end away from said driver diaphragm, the magnet system further comprising a cylinder arrangement, of a material and of a wall thickness sufficient to provide a conductivity suitable to act as a short circuit ring carrying compensating induction currents, the cylinder arrangement comprising a root part at a root area of the pole piece and an inner pole ring part rearward of the annular gap, the root part being located outside the rearward end of the voice coil when the voice coil assumes a position of rest, and further comprising an outer pole ring part located forward of the annular gap, the inner pole ring part and the outer pole ring part both being shorter than half a length of the voice coil.

5,815,588

VIDEO CAMCORDER SPEAKER ASSEMBLY

Vespucci B. Traini, Jr., 133 Aluminum City Ter., New Kensington, Pa. 15068

Continuation-in-part of Ser. No. 393,984, Feb. 24, 1995, abandoned, which is a continuation-in-part of Ser. No. 96,760, Jul. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 661,066, Feb. 26, 1991, Pat. No. 5,361,378. This application Aug. 5, 1996, Ser. No. 695,124

Int. Cl.[6] H04R *5/02*

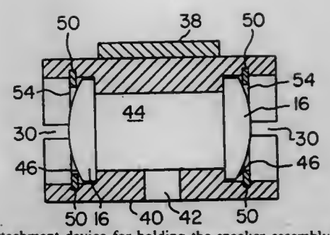
U.S. Cl. 381—309 **18 Claims**

1. A speaker assembly for connecting an audio source to a microphone of a video recorder, comprising:

a housing having an exterior and a substantially hollow interior;

an earphone assembly having at least one speaker, with said at least one speaker located in the interior of said housing;

a bore extending through said housing; and



an attachment device for holding the sneaker assembly against the video recorder microphone.

5,815,589

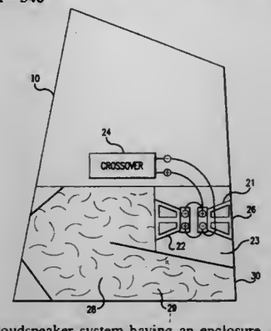
PUSH-PULL TRANSMISSION LINE LOUDSPEAKER

Charles E. Wainwright, 17400 Rocky Gorge Ct., Silver Spring, Md. 20905, and James N. Birks, 7244 Mink Hollow Rd., Highland, Md. 20777

Filed Feb. 18, 1997, Ser. No. 802,426

Int. Cl.[6] H04R *25/00;1/02;9/08*

U.S. Cl. 381—346 **13 Claims**



10. In a loudspeaker system having an enclosure, a transducer mounted in said enclosure and an acoustic transmission line provided within said enclosure and extending from said transducer to the exterior of said enclosure, the improvement comprising said acoustic transmission line being tapered to decrease in cross-sectional area from said transducer end to said exterior end, and having a taper ratio of π.

5,815,590

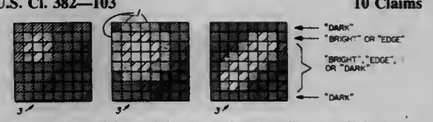
TARGET LIGHT DETECTION

Gary J. Buttner, and Rodney Norman, both of Napean, Canada, assignors to CAL Corporation, Ottawa, Canada

Filed Dec. 18, 1996, Ser. No. 769,625

Int. Cl.[6] G06K *9/20;* **G01C** *21/02*

U.S. Cl. 382—103 **10 Claims**



1. A method of determining the existence of a target light source comprising:

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(a) progressively receiving successive pixel intensity values row by row and column by column of a scanned array of a light detector,

(b) comparing each pixel intensity value as it is received with upper and lower thresholds,

(c) declaring successive rows of pixels as dark, bright, edge or null depending on whether each row of said intensity values above, between and below said thresholds meets predetermined criteria,

(d) declaring a light source as detected in the event an array of pixels exceeding said lower threshold are completely surrounded by pixels which are of lower intensity than the lower threshold, and

(e) storing a signal indicating detection of a light source in a memory with a location identifying an address of the array in which the light source was declared as detected.

5,815,591

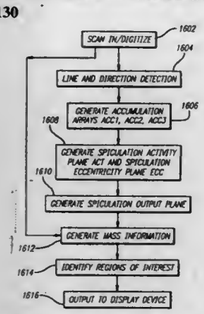
METHOD AND APPARATUS FOR FAST DETECTION OF SPICULATED LESIONS IN DIGITAL MAMMOGRAMS

Jimmy R. Roehrig, Palo Alto; Harlan M. Romsdahl, Half Moon Bay, and Wei Zhang, Mountain View, all of Calif., assignors to R2 Technology, Inc., Los Altos, Calif.

Filed Jul. 10, 1996, Ser. No. 676,660

Int. Cl.[6] G06K *9/00;* **A61B** *6/04*

U.S. Cl. 382—130 **21 Claims**



1. A method of detecting spiculations in an M×N pixel image using a cumulative array of size AM×BN pixels, where A<1 and B< 1, comprising the steps of:

determining a region of potential intersection for substantially every image pixel using line information and direction information related to that image pixel, said step of determining a region of potential intersection comprising the steps of:

determining, according to the line information related to the image pixel, whether the image pixel is located along a line, the image pixel having coordinates; and

if the image pixel is located along a line, selecting a region centered on a proportional center pixel corresponding to a predetermined pattern, said predetermined pattern being rotated by an amount related to the direction information related to the image pixel, wherein said proportional center pixel has coordinates equal to said coordinates of the image pixel scaled by A and B;

accumulating said regions of potential intersection to produce said cumulative array; and

processing information contained in said cumulative array for identifying the spiculations in the image.

5,815,592

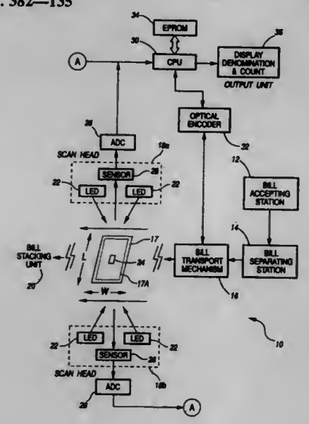
METHOD AND APPARATUS FOR DISCRIMINATING AND COUNTING DOCUMENTS

Douglas U. Mennie, Barrington; Bradford T. Graves; Lars R. Stromme, both of Arlington Heights, and Heinz W. Schreiter, Skokie, all of Ill., assignors to Cummins-Allison Corp., Mount Prospect, Ill.

Continuation-in-part of Ser. No. 243,807, May 16, 1994, Pat. No. 5,633,949, and Ser. No. 207,592, Mar. 8, 1994, Pat. No. 5,467,406, said Ser. No. 243,807 and Ser. No. 207,592, is a continuation-in-part of Ser. No. 127,334, Sep. 27, 1993, Pat. No. 5,467,405, which is a continuation of Ser. No. 889,648, May 19, 1992, Pat. No. 5,295,196, which is a continuation-in-part of Ser. No. 475,111, Feb. 5, 1990, abandoned, said Ser. No. 243,807 is a continuation-in-part of Ser. No. 219,093, Mar. 29, 1994, which is a continuation-in-part of Ser. No. 127,334. This application Nov. 14, 1994, Ser. No. 340,031

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—135 **38 Claims**



1. A currency counting and discrimination device for receiving a stack of currency bills, rapidly counting and discriminating the bills in the stack, and then re-stacking the bills comprising:

an input receptacle for receiving a stack of currency bills to be discriminated;

a denomination discriminating unit for discriminating the denomination of said currency bills.

an output receptacle for receiving said currency bills after being discriminated by said discriminating unit; and

a transport mechanism for transporting said currency bills, one at a time, from said input receptacle past said discriminating unit and to said output receptacle, said transport mechanism comprising stripping means for stripping the lowermost bill from a stack of bills in the input receptacle, first and second driven transport rolls on opposite sides of the discriminating unit for transporting each bill past the discriminating unit, said first and second transport rolls each having a circumference, said first transport roll receiving bills directly from said stripping means and transporting the received bills to the region between said first and second transport rolls.

5,815,593

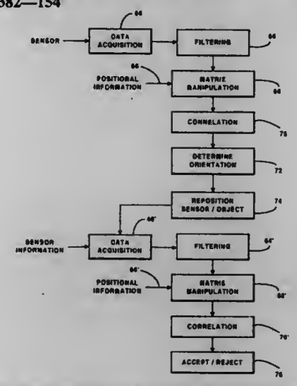
LASER SURFACE CHARACTERISTIC MEASURING

Loren E. Shaum, Syracuse; Steven J. Remis, South Bend, both of Ind., and Allen K. McVay, Edwardsburg, Mich., assignors to SMI Technology, LLC, Elkhart, Ind.

Filed Oct. 10, 1995, Ser. No. 544,403

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—154 **21 Claims**



1. A high speed method of accepting and rejecting an object by identifying specific three-dimensional surface features of interest of an object, including:

providing at least two sensors configured to make measurements of opposite surfaces of a common wall;

creating relative motion between said sensor and the object while repetitively making measurements of surface characteristics in order to create a data set wherein said data set includes a plurality of measurements made at each position on the object and positional data;

extracting from said data set a subset of data that represents surface features of interest of the object by mathematically manipulating said data set to identify three-dimensional surface features of interest of the object on each of said opposite surfaces;

providing a set of relevant surface feature data and a limit of deviation from the surface feature data which represents an acceptable object;

correlating said subset of data that represents surface features of interest of the object with said set of relevant surface feature data in order to determine an amount of deviation of the measured features of interest from the relevant surface feature data; and

accepting or rejecting said object in response to said correlating the specified tolerance by determining whether the amount of deviation is within the provided limit.

5,815,594

SEMICONDUCTOR EXPOSURE METHOD AND APPARATUS

Hiroshi Tanaka, Kamakura, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

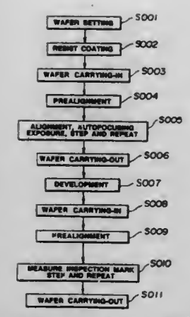
Continuation of Ser. No. 998,609, Dec. 30, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 465,566

Claims priority, application Japan, Jan. 10, 1992, 4-022056

Int. Cl.[6] G06K *9/03*

U.S. Cl. 382—151 **10 Claims**

1. A semiconductor manufacturing method comprising the steps of:



setting an inspection substrate in an exposure apparatus, the exposure apparatus having a projection optical system, measuring means and image pick-up means;

measuring a position of the inspection substrate with respect to the focal plane of the projection optical system with the measuring means;

exposing the inspection substrate through the projection optical system so as to print an inspection pattern having a plurality of inspection marks in one exposure region of the inspection substrate on the inspection substrate;

changing the distance between the projection optical system and the inspection substrate by a predetermined distance and performing said measuring step again and then exposing a different region through the projection optical system so as to print an inspection pattern having a plurality of inspection marks in the different exposure region on the inspection substrate;

performing said changing step a plurality of times to progressively increase or decrease the distance between the projection optical system and the inspection substrate by the same predetermined amount as different exposure regions have an inspection pattern printed thereon;

removing the inspection substrate from the exposure apparatus;

developing the inspection pattern printed on the inspection substrate;

re-setting the inspection substrate in the exposure apparatus;

obtaining image data of the developed inspection pattern on the inspection substrate by the image pick-up means;

calculating error data representing an error produced by the measuring means during the measuring operation by calculating an evaluation value of each printed inspection mark at different exposure regions of the inspection substrate representing the contrast of the inspection pattern at the different regions, and by determining the inclination of the inspection substrate with respect to the focal plane by the distribution of evaluation values of the inspection marks with respect to the focus of the projection optical system for each exposure region;

storing the error data in control means;

setting a semiconductor substrate instead of the inspection substrate in the exposure apparatus;

measuring a position of the semiconductor substrate with respect to the focal plane of the projection optical system by the measuring means;

obtaining corrected data on the basis of the error data stored in the control means and the position data of the semiconductor substrate measured by the measuring means;

adjusting the position of the semiconductor substrate with respect to the focal plane of the projection optical system on the basis of the corrected data; and

exposing the semiconductor substrate through the projection optical system.

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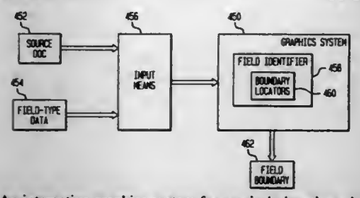
5,815,595

METHOD AND APPARATUS FOR IDENTIFYING TEXT FIELDS AND CHECKBOXES IN DIGITIZED IMAGES

Sean Gugler, Santa Clara, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 29, 1995, Ser. No. 580,845
Int. Cl.[6] G06K *9/34*
U.S. Cl. 382—173 **36 Claims**



1. An interactive graphics system for precisely locating a boundary of a user-selected field on a digitized form, comprising:

input means for receiving information pertaining to the user-selected text field on the digitized form; and

boundary locator means, coupled to said input means, for determining the boundary of the user-selected field based upon said information on the digitized form, wherein said boundary locator means comprises:

one or more field identifiers, each associated with a specific type of field; and

one or more locators, each configured to identify a particular portion of a field boundary;

wherein each of said one or more field identifiers implements one or more of said one or more locators to determine the boundary of the user-selected field.

5,815,596

MULTISCALE IMAGE EDGE AND REGION DETECTION METHOD AND APPARATUS

Narendra Ahuja, Savoy, and Mark D. Tabb, Champaign, both of Ill., assignors to Narendra Ahuja, Lyndhurst, Ill.

Continuation of Ser. No. 227,643, Apr. 14, 1994, abandoned. This application Jun. 13, 1996, Ser. No. 662,962
Int. Cl.[6] G06K *9/48*
U.S. Cl. 382—173 **16 Claims**

1. A method of determining region boundaries in an image comprising the steps of:

providing an image having a plurality of discrete points;

determining for each discrete point in said image an affinity force vector representing that discrete point's affinity to every other discrete point in the image, said step of determining an affinity force vector for each discrete point comprising the steps of:

determining a point-to-point affinity force vector for that discrete point with respect to every other discrete point, each point-to-point affinity force vector comprising a magnitude and a direction, the magnitude representing that discrete point's affinity for one other discrete point determined by using a function representing a difference between a multivalued level of the two discrete points and the direction representing the direction of that discrete point's affinity for the one other discrete point; and

vectorially summing all of the point-to-point affinity force vectors for that discrete point; and

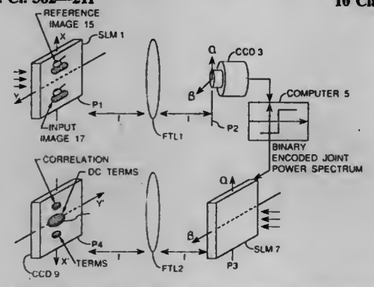
detecting region boundaries in the image using said affinity force vectors.

5,815,597

BINARY ENCODING OF GRAY SCALE NONLINEAR JOINT TRANSFORM CORRELATORS

Joseph L. Horner, Belmont, Mass., and Bahram Javidi, Storrs, Conn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 9, 1992, Ser. No. 865,564
Int. Cl.[6] G06K *9/64*
U.S. Cl. 382—211 **10 Claims**



1. An image correlation method employing a joint transform correlator comprising the steps of:

(a) providing a joint image of a reference image and an input image;

(b) producing a joint power spectrum of Fourier transforms of the reference image and the input image in a Fourier plane of said joint transform correlator;

(c) binarizing said joint power spectrum by

(c-1) producing different threshold values associated with different pixels of said joint power spectrum by computing a threshold function in accordance with the following equation:

$$V_T(\alpha, \beta: k) = 2R^2(\alpha, \beta)\,[1 + \sqrt{1 - \alpha_k^2 R^{44}(\alpha, \beta)}\,]$$

where V_T is the threshold value for binarizing the joint power spectrum; where (α,β) are the spatial frequency coordinates; where k is a known constant; and where R is the Fourier transform of the reference signal r;

(c-2) producing a binarized version of said joint power spectrum by binarizing said joint power spectrum in accordance with said threshold values; and

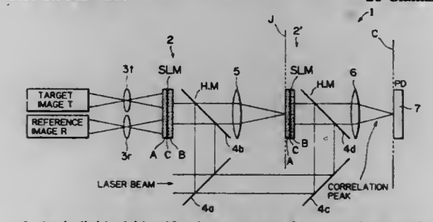
(d) inverse Fourier transforming said binarized version of said joint power spectrum for producing a correlation signal indicative of the degree of correlation between the reference image and the input image.

5,815,598

APPARATUS FOR IDENTIFYING AN INDIVIDUAL BASED ON A FINGERPRINT IMAGE

Tsutomu Hara; Yuji Kobayashi, and Haruyoshi Toyoda, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka-ken, Japan

Continuation of Ser. No. 412,218, Mar. 27, 1995, abandoned, which is a continuation of Ser. No. 113,254, Aug. 30, 1993, abandoned. This application Nov. 19, 1997, Ser. No. 974,674
Claims priority, application Japan, Aug. 28, 1992, 4-230054
Int. Cl.[6] G06K *9/76;9/00;* **G02F** *1/135;1/03*
U.S. Cl. 382—211 **21 Claims**



1. An individual identification apparatus for measuring correlation between a body portion of a specific individual and a body portion of an arbitrary individual to thereby determine whether the arbitrary individual is or is not the specific individual, the individual identification apparatus comprising:

first positioning means for positioning, at a predetermined first position, a portion of a body of an arbitrary individual to be identified with a specific individual;

first reading means for irradiating light onto the portion of the body of the arbitrary individual which is positioned at the first position to obtain a single optical image of the portion of the body of the arbitrary individual;

specific individual image producing means for producing a single optical image of a portion of a body of the specific individual based on information contained in an image of the portion of the body of the specific individual;

light producing means for producing coherent first and second read-lights, the second read-light being a linearly-polarized coherent beam having a polarization plane parallel to a first plane;

first spatial light modulating means for receiving an optical joint image made up of the single optical image of the portion of the body of the arbitrary individual and the single image of the portion of the body of the specific individual, the optical joint image having the single image of the portion of the body of the specific individual and the single image of the portion of the body of the arbitrary individual at different positions, said first spatial light modulating means receiving the first read-light and modulating the first read-light in accordance with the joint image to output the modulated first read-light:

a lens for Fourier transforming the modulated first read-light outputted from said first spatial light modulating means to thereby produce an optical Joint Fourier Transform image;

second spatial light modulating means for receiving the optical Joint Fourier Transform image and for receiving the second read-light and modulating the second read-light in accordance with the Joint Fourier Transform image to output a modulated second read-light, said second spatial light modulating means including a second optically-addressable spatial light modulator which has a single cell structure having a single optically-addressing part and a single modulating part, the optically-addressing part receiving the optical Joint Fourier Transform image and changing optical characteristic of the modulating part in accordance with the optical Joint Fourier Transform image, the modulating part receiving the second read-light and modulating the second read-light in accordance with the changed optical characteristic to output the modulated second read-light;

wherein the modulating part of said second optically-addressable spatial light modulator receives the second read-light and modulates phase of the second read-light in accordance with the changed optical characteristic,

wherein the optically-addressing part of said second optically-addressable spatial light modulator includes a photosensing layer made of photoelectric material, said photosensing layer receiving the optical Joint Fourier Transform image and changing impedance of the photoelectric material dependently on the optical Joint Fourier Transform image,

wherein the modulating part of said second optically-addressable spatial light modulator includes a liquid crystal layer formed of liquid crystal molecules of nematic phase and a pair of alignment layers provided to sandwich said liquid crystal layer therebetween for arranging the liquid crystal molecules in said liquid crystal layer in a homogenous arrangement so that the liquid crystal molecules are arranged to extend along a plane parallel to the first plane,

wherein said second optically-addressable spatial light modulator further includes electric voltage applying means for applying an electric voltage through said photosensing layer and said liquid crystal layer to thereby produce an electric field in said liquid crystal layer, and

wherein said photosensing layer changes the electric field produced in said liquid crystal layer in accordance with the changed impedance of the photoelectric material and causes the liquid crystal molecules to rotate along the plane parallel to the first plane due to dielectric anisotropy of the nematic liquid crystal molecules so as to electrically control the birefringence of the liquid crystal molecules to modulate the phase of the linearly-polarized second read-light in accordance with the electrically controlled birefringence,

a lens for Fourier transforming the second read-light modulated by and outputted from said second spatial light modulating means to thereby produce an optical output correlation image;

intensity detecting means for detecting intensity of the optical output correlation image: and

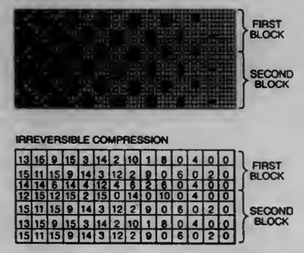
calculating means for comparing a value of the detected intensity with a predetermined threshold value so as to judge correlation of the image of the portion of the body of the specific individual and the image of the portion of the body of the arbitrary individual to thereby determine whether or not the arbitrary individual and the specific individual are the same individual.

5,815,599

IRREVERSIBLE COMPRESSION SYSTEM AND METHOD FOR BIT MAP IMAGES

Takumi Iwasaki, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 12, 1995, Ser. No. 501,464
Claims priority, application Japan, Jul. 27, 1994, 6-175737
Int. Cl.[6] G06K *9/36;9/40;* **H04N** *1/40*
U.S. Cl. 382—232 **6 Claims**



1. An irreversible compression system comprising:

fetching means for fetching cells of bit map data from first and second adjacent blocks of bit map data, each of the fetched cells having a predetermined cell size; and

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converting means for converting each of the fetched cells to compressed code;

wherein when the size of the first block of bit map data is indivisible by the predetermined cell size, the fetching means fetches from the first block a first incomplete cell having a first reduced size and fetches from the second block a second incomplete cell, the second incomplete cell being adjacent the first incomplete cell and having a second reduced size such that the sum of the first reduced size and the second reduced size is equal to the predetermined cell size.

5,815,600

IMAGE DATA SIGNAL COMPRESSION/TRANSMISSION METHOD AND IMAGE DATA SIGNAL COMPRESSION/ TRANSMISSION SYSTEM

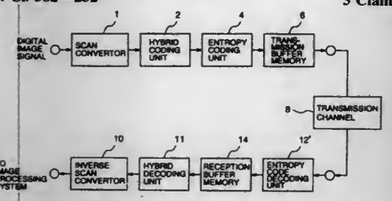
Seiichi Sano, Kodaira; Shuji Usui, Hachioji; Atsushi Miyashita, Tokorozawa; Yuuichi Oonami, Iruma; Takayuki Tanaka, and Ryu Watanabe, both of Tokyo, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1995, Ser. No. 517,585

Claims priority, application Japan, Aug. 25, 1994, 6-200349

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—232 **5 Claims**



1. An image data signal transmission system for transmitting and receiving a compressed image data signal comprising:

a scan converter for scanning a digital image signal which has been scanned in a predetermined scanning scheme in a different scanning scheme;

a hybrid coding unit for performing transform coding and predictive coding on an outputted image data signal from said scan converter and outputting the coded coefficient codes;

an entropy coding unit for converting the output from said hybrid coding unit to entropy-coded codes;

a first memory unit for storing therein said entropy-coded codes and reading said stored codes at a speed corresponding to a predetermined transmission rate;

a transmission channel for transmitting said codes read from said first memory unit at said predetermined transmission rate;

an entropy code decoding unit for entropy code decoding said entropy-coded codes transmitted through said transmission channel at a decoding speed corresponding to said predetermined transmission rate on said transmission channel to generate coefficient codes;

a second memory unit for storing therein said coefficient codes generated in said entropy code decoding unit and reading said stored coefficient codes at a speed different from said decoding speed;

a hybrid decoding unit for hybrid decoding said coefficient codes read from said second memory unit and outputting decoded data; and

an inverse scan converter for scanning said decoded data from said hybrid decoding unit in a manner inverse to the scanning performed by said scan converter.

5,815,601

IMAGE ENCODER AND IMAGE DECODER

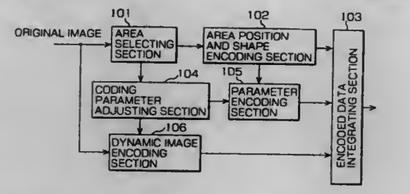
Hiroyuki Katata, and Hiroshi Kusao, both of Chiba, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1996, Ser. No. 608,508

Claims priority, application Japan, Mar. 10, 1995, 7-51089

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—232 **20 Claims**



1. An image encoder for dividing input image data into a plurality of blocks and encoding the image data block by block, comprising:

area selecting means for selecting an area to be encoded in high image quality from said image data;

area position and shape encoding means for encoding position data and shape data of said area;

parameter adjusting means for adjusting coding parameter data used for encoding said image data so as to make the image quality of said area better than that of the other areas;

parameter encoding means for encoding said coding parameter data;

image encoding means for encoding said image data by using the adjusted coding parameter data; and

encoded data integrating means for outputting encoded data of said image by combining data encoded by said area position and shape encoding means, said parameter encoding means, and said image encoding means.

5,815,602

DCT IMAGE COMPRESSION AND MOTION COMPENSATION USING THE HADAMARD TRANSFORM

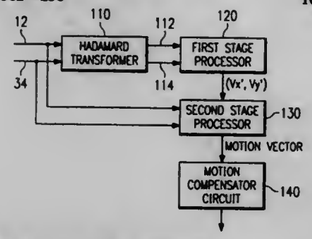
Hideaki Ueda, and Hirohisa Yamaguchi, both of Ibaraki, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 5, 1995, Ser. No. 523,735

Claims priority, application Japan, Sep. 2, 1994, 6-210061

Int. Cl.[6] G06K *9/36;9/46*

U.S. Cl. 382—236 **10 Claims**



1. A data processing device comprising:

(a) Hadamard transformation means for receiving first and second image data and for transforming said first and second image data by Hadamard transformation;

(b) first processing means coupled to said Hadamard transformation means and receiving said first and second Hadamard transformed data each corresponding to said first and second image data, for comparing said first and second Hadamard transformed data to select an estimated position in the second image data corresponding to a target block in the first image data;

(c) second processing means coupled to said first processing means to receive the estimated position and receiving said first and second image data, to determine a motion vector for said target block bv performing a fill search in the vicinity of the estimated position in the second image data; and

(d) coding means for coding differences between said first image data and second image data compensated by said motion vector.

5,815,603

Patent Not Issued For This Number

5,815,604

INTERACTIVE IMAGE MANIPULATION

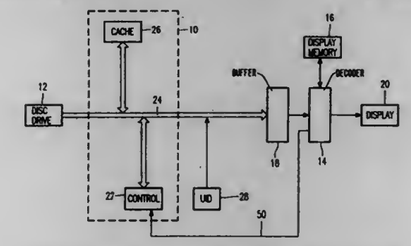
Paul R. Simons, Crawley, and Octavius J. Morris, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1996, Ser. No. 635,340

Claims priority, application United Kingdom, May 18, 1995, 9510093

Int. Cl.[6] G06T *5/50*

U.S. Cl. 382—250 **9 Claims**



1. Interactive image manipulation apparatus having an input for discrete cosine transform (DCT) coded macroblocks of pixel data and comprising:

an image data cache;

a pre-processing controller for processing received macroblock data, said pre-processing controller generating at least two independent representations of each macroblock for use as a first or a continuation macroblock, respectively, in a line of macroblock data in an assembled image, storing said representations in the image data cache, and generating a DCT coded image from selected ones of said representations read from the image data cache;

user input means coupled to the preprocessing controller, the selection of stored macroblock representations in the generated image being at least partially determined by input from the user input means; and

a decoder for receiving and decoding the generated DCT coded image.

5,815,605

IMAGE PROCESSING SYSTEM AND METHOD

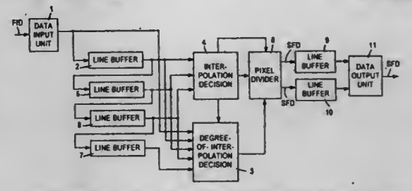
Kazumasa Koike, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 91,573, Jul. 15, 1993, abandoned. This application May 17, 1995, Ser. No. 440,224

Claims priority, application Japan, Jul. 17, 1992, 4-212342

Int. Cl.[6] G06K *9/32*

U.S. Cl. 382—269 **16 Claims**



1. An image processing method for dividing each pixel of binary image data into sub-pixels, each of said sub-pixels having a size smaller than each pixel, said image processing method comprising the steps of:

selecting a pixel of interest for image processing; determining a first white/black pattern formed by a first group of pixels next to and enclosing the entire outer periphery of said pixel of interest;

determining a second white/black pattern formed by a second group of pixels next to and enclosing the outer periphery of the first group of pixels;

dividing the pixel of interest into sub-pixels;

identifying a first white/black pattern distribution of the first group of pixels;

selecting a selected pixel from a single side of said second group of pixels and comparing a color of said selected pixel with a color of said pixel of interest, wherein colors of pixels in said single side of the second white/black pattern are extensions of colors of pixels in the first white/black pattern and based on the color of the pixel of interest;

determining colors of the sub-pixels based on said comparing the color of said selected pixel from said single side of the second white/black pattern with the color of said pixel of interest so that an image formed by the sub-pixels has smoothed slant or jagged image portions;

determining based on the first white/black pattern whether or not an interpolation process for the sub-pixels should be performed; and

performing the interpolation process when it is determined that the interpolation should be performed so that the colors of the sub-pixels are determined based on the second white/black pattern.

5,815,606

METHOD FOR THRESHOLDING A GRAY SCALE MATRIX

Walter J. Baker, Stratford, and Gary M. Helden, Shelton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 23, 1996, Ser. No. 773,541

Int. Cl.[6] H04N *1/405*

U.S. Cl. 382—237 **20 Claims**

1. A method for generating a binary matrix representative of an image from a gray scale matrix representative of said image, said method comprising the steps of:

a) determining characteristics of a plurality of elemental features of said image;

b) selecting a plurality of thresholding algorithms;

c) for each of said algorithms, repetitively generating a sequence of binary matrices from said gray scale matrix while varying a scaling factor applied to each of said algorithms;

d) determining characteristics of features of each binary matrix generated in step c; and

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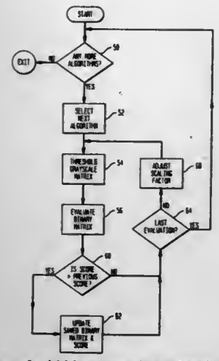


e) selecting one of said binary matrices wherein said determined characteristics are most nearly similar to said characteristics of said image.

5,815,607

IMAGE READING DEVICE, AND INSPECTION APPARATUS AND EXPOSURE APPARATUS USING THE DEVICE

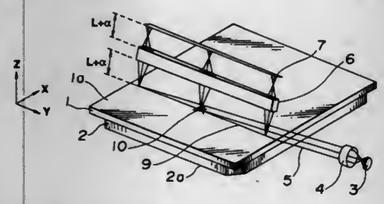
Seiya Miura, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 275,276, Jul. 15, 1994, abandoned. This application Oct. 22, 1996, Ser. No. 734,846

Claims priority, application Japan, Jul. 19, 1993, 5-178154

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—275 **9 Claims**



1. A surface inspection device, comprising:

a lens array for forming an image of a surface to be inspected;

a sensor array for reading the formed image, with the sensor array including a plurality of pixels, with at least some of the pixels including a dead zone,

wherein said lens array and said sensor array are disposed so that the surface to be inspected is situated at a position separated by a predetermined distance (α) which is not zero from one of two opposed conjugate points of said lens array and the photosensing surface of said sensor array is situated at a position separated by the predetermined distance (α) from another one of the two opposed conjugate points of said lens array, such that defocused light beams from respective lenses of said lens array are condensed onto substantially the same point on the photosensing surface to cover an area of at least 9 pixels of said sensor array, so as to compensate for the dead zone of said sensor array; and

means for inspecting the surface to be inspected based on an output from said sensor array.

5,815,608

APPARATUS AND METHOD FOR SENSING AND PROCESSING IMAGES

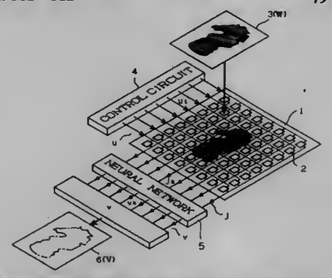
Eberhard Lange; Kunihiko Hara; Eiichi Funatsu; Jun Ohta; Shuichi Tai; Yoshikazu Nitta; Yuichi Koshiba; Takashi Toyoda, and Kazuo Kyuma, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 432,704, May 2, 1995, abandoned, which is a continuation of Ser. No. 36,271, Mar. 24, 1993, abandoned. This application Jul. 29, 1996, Ser. No. 688,684

Claims priority, application Japan, Mar. 25, 1992, 4-067499; Jun. 24, 1992, 4-188899; Aug. 28, 1992, 4-251848; Sep. 14, 1992, 4-269100; Dec. 11, 1992, 4-352395

Int. Cl.[6] G06K *9/20*

U.S. Cl. 382—312 **79 Claims**



1. An apparatus for sensing and processing images comprising:

an array of variable sensitivity photo detectors arranged in a matrix form, said variable sensitivity photo detectors having a conversion efficiency which is a monotone, smoothly increasing function of an applied control voltage, wherein the conversion efficiency can assume both positive and negative values;

a control circuit for feeding rows of said array with voltages for sensitivity control; and

a neural network for processing currents flowing from columns of said array to ground.

5,815,609

WAVEGUIDE TYPE OPTICAL EXTERNAL MODULATOR

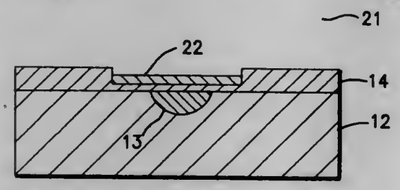
Atsushi Toyohara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 4, 1996, Ser. No. 706,532

Claims priority, application Japan, Sep. 13, 1995, 7-235036

Int. Cl.[6] G02B *6/126*

U.S. Cl. 385—2 **12 Claims**



1. A waveguide type optical device, comprising:

a lithium niobate substrate;

a Ti diffused waveguide formed in said lithium niobate substrate;

an electrode formed on said Ti diffused waveguide for applying an electric field to said Ti diffused waveguide;

a first buffer layer made of SiO_2 and formed as a film between said electrode and said Ti diffused waveguide; and

a second buffer layer made of Si and formed as a film in a recess in at least part of said first buffer layer above said Ti diffused waveguide.

5,815,610

OPTICAL MODULATION SYSTEM

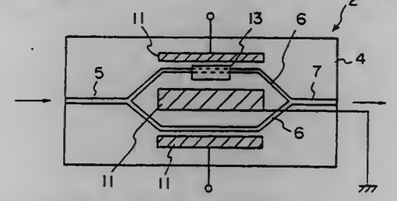
Yuichi Tokano; Ryoji Muramatsu; Takanobu Tanabe, and Tsugio Takeda, all of Sendai, Japan, assignors to Tokin Corporation, Miyagi, Japan

Division of Ser. No. 397,077, Mar. 7, 1995, Pat. No. 5,638,468. This application Mar. 3, 1997, Ser. No. 810,557

Claims priority, application Japan, Jul. 7, 1993, 5-168156; Dec. 6, 1993, 5-339978; Jan. 26, 1994, 6-24758

Int. Cl.[6] G02F *1/035*

U.S. Cl. 385—2 **6 Claims**



1. An optical modulation system comprising:

a substrate;

an incident optical waveguide formed on said substrate for receiving a light beam incident thereto;

two phase-shift optical waveguides formed on said substrate and being branched from said incident optical waveguide for varying a phase of a transmitted light beam in response to an electric field intensity;

an outgoing optical waveguide formed on said substrate and joined to said two phase-shift optical waveguides; and

a light transmission film formed at one or a plurality of portions on one of said two phase-shift optical waveguides.

5,815,611

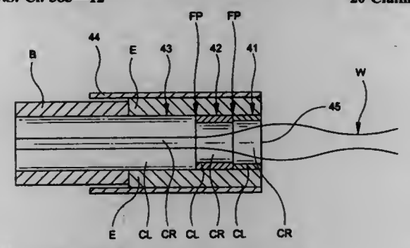
METHOD AND APPARATUS FOR SUBMICROSCOPIC PARTICLE SIZING, AND PROBE THEREFOR

Harbans S. Dhadwal, Setauket, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 514,264, Aug. 11, 1995, Pat. No. 5,627,642. This application Jan. 2, 1997, Ser. No. 778,403

Int. Cl.[6] G02B *6/255*

U.S. Cl. 385—12 **20 Claims**



9. An integrated fiber optic probe comprising:

a monomode optical fiber;

a step index, multimode optical fiber fusion spliced to said monomode optical fiber;

a gradient index, multimode optical fiber fusion spliced to said step index, multimode optical fiber, and

a housing, said monomode, step index multimode and gradient index multimode optical fibers mounted to said housing.

5,815,612

Patent Not Issued For This Number

5,815,613

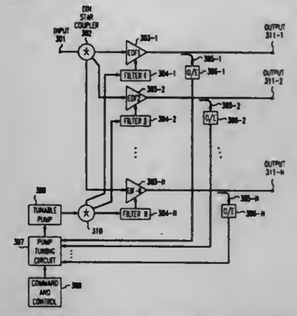
OPTICAL SWITCHED DISTRIBUTOR

Mohammad T. Fatehi, Middletown, and Wayne Harvey Knox, Rumson, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 31, 1996, Ser. No. 777,894

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—22 **9 Claims**



6. An optical distributor for coupling into an optical fiber system, the optical distributor having an input and a plurality of outputs comprising:

a plurality of fiber optical amplifiers corresponding to the plurality of outputs, each employed as a switching element, wherein each of the fiber optical amplifiers comprises an optical rare earth-doped fiber having a predetermined length and a corresponding filter;

a coupling element for coupling an incoming optical signal to each of the plurality of fiber optical amplifiers; and

a pump arrangement responsive to a command signal for optically controlling ON/OFF states of each of said plurality of fiber optical amplifiers so that the incoming optical signal is supplied to one or more of said plurality of outputs, the pump arrangement including a tunable pump and a pump tuning circuit and a coupler for coupling an output from the tunable pump to each of the filters corresponding to the plurality of fiber optical amplifiers, the pump tuning circuit being responsive to command and control signals for controlling the tunable pump to supply pumping signals for turning ON/OFF one or more of the plurality of fiber optical amplifiers, the filters filtering the pump signal to effect the turning ON/OFF of the one or more of the plurality of fiber optical amplifiers.

5,815,614

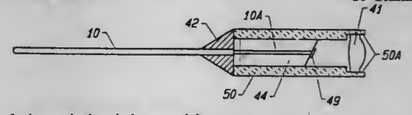
1 X N ELECTROMECHANICAL OPTICAL SWITCH

Jing-Jong Pan, San Jose, Calif., assignor to E-Tek Dynamics, Inc., San Jose, Calif.

Continuation of Ser. No. 512,752, Aug. 9, 1995, Pat. No. 5,611,009, which is a continuation of Ser. No. 307,114, Sep. 16, 1994, Pat. No. 5,479,541, which is a continuation of Ser. No. 74,765, Jun. 10, 1993, Pat. No. 5,359,683. This application Jan. 6, 1997, Ser. No. 779,133

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—22 **10 Claims**



1. An optical switch comprising:

a first optical fiber having an end surface;

a first collimating lens having a longitudinal axis and a surface adjacent to the end surface of the first optical fiber;

a plurality of N optical fibers, each having an end surface;

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a plurality of N collimating lenses, each having a longitudinal axis and a surface adjacent to the end surface of one of the N optical fibers, the first optical fiber forming an optical path with one of the plurality of N optical fibers by an alignment of the longitudinal axis of the first collimating lens with the longitudinal axis of one of the plurality of N collimating lenses; and

a means for effecting an angular movement of the first collimating lens with respect to the N collimating lenses, the angular movement means coupled to the first collimating lens, the angular movement means adapted for switching the optical path by realigning the longitudinal axis of the first collimating lens with the longitudinal axis of another one of the plurality of collimating lenses.

5,815,615

INTEGRATED OPTICAL CONTROL ELEMENT AND A METHOD FOR FABRICATING THE SAME AND OPTICAL INTEGRATED CIRCUIT ELEMENT AND OPTICAL INTEGRATED CIRCUIT DEVICE USING THE SAME

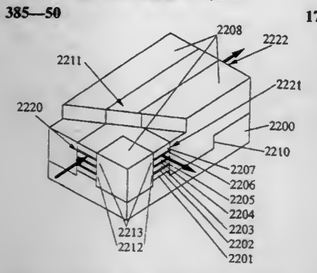
Mototaka Taneya; Fumihiro Konushi; Hidenori Kawanishi, all of Nara; Tatsuya Morioka, Tenri, and Atsushi Shimonaka, Nara-ken, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1995, Ser. No. 579,437

Claims priority, application Japan, Dec. 28, 1994, 6-328585; Aug. 17, 1995, 7-209745

Int. Cl.[6] G02B *6/26;6/42*

U.S. Cl. 385—50 **17 Claims**



1. An integrated optical control element comprising:

a first waveguide for allowing light incident from outside to propagate therein;

a multilayer structure for allowing the light which has propagated in the first waveguide to be incident thereon and for transmitting the light therethrough or reflecting the light therefrom, the multilayer structure including at least one layer having a refractive index different from an equivalent refractive index of a region with which the at least one layer is in contact; and

a second waveguide for receiving at least part of the light transmitted through or reflected from the multilayer structure,

wherein each of the first waveguide and the second waveguide is a channel type waveguide in which a propagating light is confined in a lateral direction of the waveguide.

5,815,616

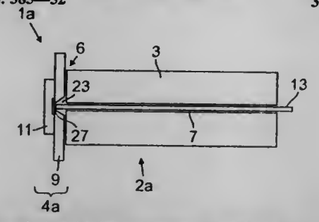
OPTICAL PACKAGING ASSEMBLY FOR REFLECTIVE DEVICES

David J. Bishop, Summit; Joseph E. Ford, Oakhurst; William M. MacDonald, Lebanon; Rene R. Ruel, Bridgewater, and James A. Walker, Howell, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 2, 1997, Ser. No. 778,119

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—52 **37 Claims**



1. An optical packaging subassembly comprising:

a packaging component having a first alignment/mating feature, and a fiber alignment region for receiving an optical fiber; and

a reflective optical device attached to the packaging component, the reflective optical device having a second alignment/mating feature; wherein,

the first alignment/mating feature and the second alignment/mating cooperate to align and mate the packaging component to the reflective optical device, and further wherein when so mated, the fiber alignment region optically aligns the optical fiber with the reflective optical device.

5,815,617

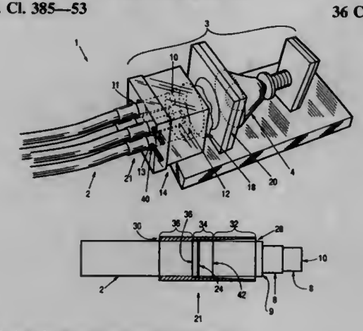
FIBER OPTIC CABLE CONNECTOR

Kenneth G. Hollar, Richton Park, Ill., assignor to Federal Signal Corporation, University Park, Ill.

Filed Oct. 25, 1996, Ser. No. 736,985

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—53 **36 Claims**



20. A light source assembly comprising:

a light source for illuminating an end of at least one fiber optic cable, the fiber optic cable having a core for transmitting signals and a protective jacket surrounding the core,

a connector including a band having inner and outer surfaces and flexible between locked and unlocked positions in response to a compressive force, wherein the inner surface is dimensioned to slidably engage the protective jacket in the unlocked position and has means for securely engaging the fiber optic cable jacket in the locked position for preventing relative movement between the band and the cable jacket, and means for exerting the compressive force on the band so that the band securely engages the cable jacket, and wherein the outer surface has a substantially smooth surface without any projections for permitting the band to disengage from the exerting means after the exerting means has compressed the band into secure engagement with the cable jacket, and

a retaining block having a hole for receiving and retaining at least one cable in predetermined position relative to the light source.

5,815,618

ADAPTOR FOR INTERCONNECTING OPTICAL FIBERS

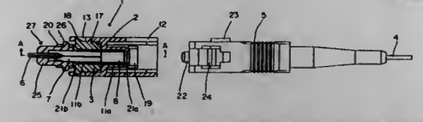
Tsunehiro Takahashi, Yamato, and Akihiro Miyachi, Fuchu, both of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed May 27, 1997, Ser. No. 863,452

Claims priority, application Japan, Jun. 7, 1996, 8-168551; Jul. 5, 1996, 8-195570

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—60 **3 Claims**



1. An adaptor assembly for interconnecting a pair of opposing optical fibers generally along an optical axis, each fiber being terminated in its respective ferrule, one of the ferrules mounted in an optical fiber connector and the other ferrule mounted in an optical fiber plug, the adaptor assembly being constructed as a double ended receptacle for receiving the connector and the plug in opposite open ends thereof, the adaptor assembly further including an outer and an inner hollow body constructed to allow the inner body to telescope within the outer body, a guide cylinder mounted in the adaptor assembly for accommodating and aligning the two ferrules, interengagement means between the outer and inner bodies for locking the bodies together, means for releasably mounting the optical fiber connector in one side of the adaptor with the end of its ferrule located within the guide cylinder and means for releasably mounting the plug in the opposite side of the adaptor with the end of its ferrule located within the guide cylinder.

5,815,619

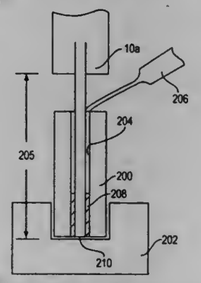
FIBER OPTIC CONNECTOR HERMETICALLY TERMINATED

Cary Bloom, 251 Blaze Climber Way, Rockville, Md. 20850

Filed Dec. 10, 1996, Ser. No. 763,125

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—78 **48 Claims**



1. A fiber optic connector, comprising:

a ferrule having an outside diameter and a throughbore;

an optical fiber having a portion positioned within said throughbore; and

a metal comprising essentially of at least one of pure aluminum and cold, forming a hermetic seal between said ferrule and the portion of said optical fiber.

5,815,620

SUPPORT RECEPTACLE AND METHOD FOR PRODUCING THE SAME

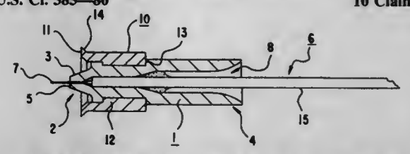
Axel Beier, and Hans-Dieter Weigel, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 5, 1997, Ser. No. 795,082

Claims priority, application Germany, Feb. 5, 1996, 196 05 027.8

Int. Cl.[6] G02B *6/00;6/36*

U.S. Cl. 385—80 **10 Claims**



1. A support receptacle for coupling an optical cable end piece, comprising:

an outer metal sleeve having a coupling side with a flange of weldable material for permanent fixation to a counterpart surface of a coupling partner; and

a receiving body at least partly surrounded by said sleeve, injection molded directly in said sleeve and form-lockingly fixed directly in said sleeve, said receiving body having a through-conduit in longitudinal direction for fixation of portions of a partially unsheathed optical cable having a fiber with an unsheathed front end to be fixed in said receiving body.

5,815,621

OPTICAL FIBER CONNECTOR FERRULE WITH DIE AND METHOD OF MANUFACTURING SAME

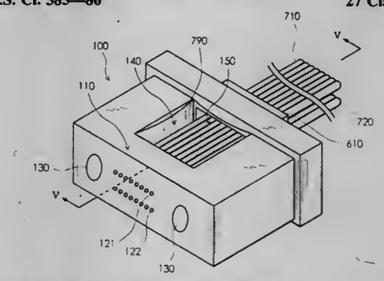
Kazuaki Sakai; Hidetoshi Ishida, and Toshiaki Kakii, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 18, 1997, Ser. No. 802,173

Claims priority, application Japan, May 30, 1996, 7-157452; May 23, 1996, 7-128720; Jun. 7, 1996, 7-166611; Jul. 4, 1996, 7-192748

Int. Cl.[6] G02B *6/36;* **B24D** *11/00*

U.S. Cl. 385—80 **27 Claims**



1. An optical connector ferrule comprising:

a holding portion arranged at a position along an inserting direction of optical fibers to constitute a front surface of said ferrule and having a plurality of first through holes for inserting said optical fibers therethrough and two second through holes for inserting guide pins, said holding portion holding portions of said optical fibers near distal ends thereof, the second through holes and the first through holes having central axes that are substantially parallel to each other, and the first through holes being arrayed in two rows in a direction connecting centers of the second through holes; and

an optical fiber tape accommodating portion having an insertion opening for inserting therethrough optical fiber tapes having said optical fibers held by said holding portion, an internal

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space for partially accommodating said optical fiber tapes, and an injection opening for injecting therethrough an adhesive for adhering and fixing said inserted optical fiber tapes and said ferrule with each other,

wherein said optical connector ferrule is formed integrally by resin molding.

3. A die for forming an optical connector ferrule, comprising:

an upper die metal block and a lower die metal block respectively having recessed portions formed to have predetermined shapes so as to constitute a cavity for forming an optical connector ferrule when major surfaces of said upper and lower die metal blocks are brought into tight contact with each other to sandwich upper core pins and lower core pins arrayed in two rows to form first through holes for optical fiber insertion, a spacer arranged between the rows of said upper and lower core pins, and two guide hole formation pins for forming second through holes guide pin insertion, the rows of said upper and lower core pins being arrayed between said two guide hole formation pins when said cavity for forming said optical connector ferrule is constituted,

wherein said upper die metal block has a first positioning mechanism portion for positioning said upper core pins and a second positioning mechanism portion for positioning an upper side of said guide hole formation pins, and

said lower die metal block has a third positioning mechanism portion for positioning said lower core pins and a fourth positioning mechanism portion for positioning a lower side of said guide hole formation pins.

5,815,622

Patent Not Issued For This Number

5,815,623

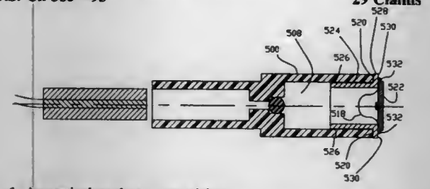
OPTICAL PACKAGE WITH ALIGNMENT MEANS AND METHOD OF ASSEMBLING AN OPTICAL PACKAGE

Patrick B. Gilliland, Chicago; Scott C. Erickson, Bartlett; Daniel S. Poplawski, Montgomery; Luis Torres, Schaumburg; Donald Rimdzius, Addison; Leonid Shatskin, Wheaton, all of Ill., and Roger Weiss, Foxborough, Mass., assignors to Methode Electronics, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 588,445, Jan. 18, 1996. This application May 23, 1997, Ser. No. 862,899

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—93 **29 Claims**



1. An optical package comprising:

a substrate having an optical device mounted thereon;

a plastic housing having a bore for receiving an optical waveguide, and an optics cavity axially aligned with the bore, the optics cavity further including a lens cavity formed therein between the optic cavity and the bore, the lens cavity being configured to receive an independent focusing element, and the optical cavity being configured to receive the optical device;

a mounting member associated with the housing providing alignment maneuverability of the substrate relative to the housing, and providing a structure for fixedly securing the substrate to the housing.

5,815,624

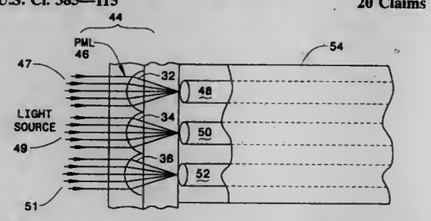
OPTICAL FIBER VIEWING APPARATUS

Gary J. Rosenberg, 724 Gloucester St., Boca Raton, Fla. 33487

Filed Aug. 30, 1996, Ser. No. 705,785

Int. Cl.[6] G02B *6/04*

U.S. Cl. 385—115 **20 Claims**



9. A blind spot viewing apparatus comprising: a coherent optical fiber cable comprised of a bundle of single optical fibers, said optical fiber cable having a first end and a second end; an input assembly having first lenslet array made up of individual lenslets, said first lenslet array coupled to said first end of said optical fiber cable, said first lenslet array coupled so that individual lenslets align with and focus light onto the core of each single optical fiber in said optical fiber cable; and a second input assembly having a second lenslet array made up of individual lenslets, said array coupled to said second end of said optical fiber cable, said second lenslet array coupled so that individual lenslets align with and collect light emerging from each single optical fiber for focusing said light towards a viewing position providing for the transfer of a focused image.

5,815,625

GLASS AND FIBER OPTIC PLATE USING THE SAME

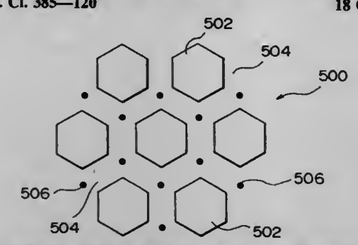
Takeo Sugawara, Hamamatsu, Japan, assignor to Hamamatsu Photonics K.K., Hamamatsu, Japan

Division of Ser. No. 674,802, Jul. 3, 1996, Pat. No. 5,696,039. This application May 23, 1997, Ser. No. 863,004

Claims priority, application Japan, Jul. 4, 1995, 7-168711

Int. Cl.[6] G02B *6/04*

U.S. Cl. 385—120 **18 Claims**



1. A fiber optic plate formed by a plurality of optical fibers which are united together while being bundled together, said fiber optic plate comprising:

a plurality of cores made of a core glass, said cores propagating incident light;

a clad covering respective peripheries of said cores, said clad being made of a clad glass whose refractive index is lower than the refractive index of said core glass; and

an absorber disposed between said plurality of cores, said absorber being made of a glass containing 18 to 40% by weight of SiO_2 and not less than 20% by weight of FeO and Fe_2O_3 in total and absorbing stray light which has leaked from said core and entered said clad.

5,815,626

OPTICAL TRANSMISSION DEVICE, SOLID STATE LASER DEVICE, AND LASER BEAM PROCESSING DEVICE

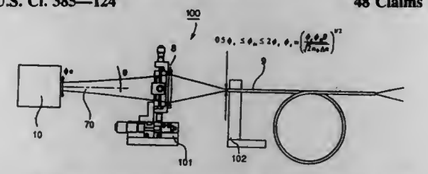
Kazuki Kuba; Akira Ishimori; Koji Yasui, all of Hyogo; Kenji Kumamoto, and Kuniaki Iwashiro, both of Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 541,042, Oct. 11, 1995, abandoned. This application Sep. 18, 1996, Ser. No. 714,304

Claims priority, application Japan, Oct. 14, 1994, 6-249459; Sep. 29, 1995, 7-253637

Int. Cl.[6] G02B *6/02*

U.S. Cl. 385—124 **48 Claims**



1. An optical transmission device for transmitting a laser beam, comprising:

a optical fiber comprising an graded index optical fiber having a diameter ϕ_c of a core of said optical fiber, a refraction index n_0 at a center of said core of said optical fiber, and a difference Δn between refraction indexes of the center of said core of said optical fiber and a peripheral section of said core of said optical fiber; and

an optical fiber incident system having a smallest focussed point at an incident side plane in said optical fiber through which the laser beam being introduced into said optical fiber or near said incident side plane of said optical fiber, and a diameter ϕ_{in} of the laser beam at said incident side plane of said optical fiber having a following relationship:

$$0.5\phi_s \leq \phi_{in} \leq 2.\phi_s,$$

and

$$\phi_s = (\phi_c \phi_0 \theta (2n_0 \Delta n)^{-1/2})^{1/2},$$

where a diameter of the laser beam waist of the laser beam is θ_0, and an opening angle of the laser beam is 2θ.

5,815,627

CO-AXIAL HOLLOW CORE WAVEGUIDE

James A. Harrington, Martinsville, N.J., assignor to Rutgers, The State University of New Jersey, Piscataway, N.J.

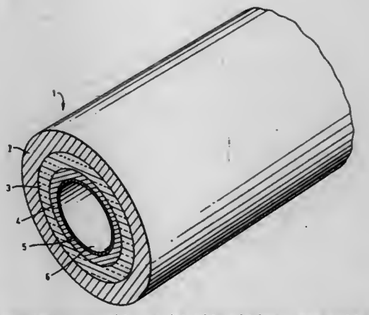
Continuation-in-part of Ser. No. 512,672, Aug. 8, 1995, Pat. No. 5,567,471, which is a division of Ser. No. 181,852, Jan. 13, 1994, Pat. No. 5,440,664. This application Aug. 8, 1996, Ser. No. 730,116

Int. Cl.[6] G02B *6/20*

U.S. Cl. 385—125 **32 Claims**

15. A dual waveguide for transmitting first and second beams of electromagnetic radiation from at least one radiation source comprising:

(a) a hollow inner waveguide configured to transmit the first beam;



(b) an outer waveguide coaxial with said inner waveguide and configured to transmit the second beam, the outer waveguide having an annular cross-sectional shape.

5,815,628

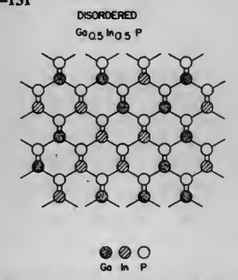
ORDERED SEMICONDUCTOR HAVING PERIODICAL DISORDER AND DEVICES MADE THEREFROM

Yoshiyasu Ueno, Ibaraki, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 17, 1996, Ser. No. 633,882

Int. Cl.[6] G02B *6/10*

U.S. Cl. 385—131 **17 Claims**



1. An optical semiconductor device comprising a guide layer defining a path for guiding an incident light therethrough, said guide layer being made of an ordered semiconductor having an axis of symmetry, wherein said guide layer has an interaction region interposed in said path and comprises periodic disordered regions created in said ordered semiconductor.

5,815,629

CAP SLEEVE FOR LIGHT WAVEGUIDE CABLES

Lothar Finzel, Unterschleissheim, and Guenter Schroeder, Essing, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 16, 1996, Ser. No. 698,726

Claims priority, application Germany, Aug. 18, 1995, 195 30 479.9

Int. Cl.[6] G02B *6/00*

U.S. Cl. 385—134 **11 Claims**

1. In a cap sleeve for light waveguide cables comprising a plurality of splicing cassettes combined in a splicing block for the acceptance of light waveguide splices, the improvements comprising a fastening frame being arranged in a seal member of the cap sleeve, said fastening frame having a storage space for uncut light waveguide multi-fiber loose bundled strands, fastening pins being arranged on the fastening frame for holding splicing cassettes, each of the splicing cassettes having a housing with a guide slot into

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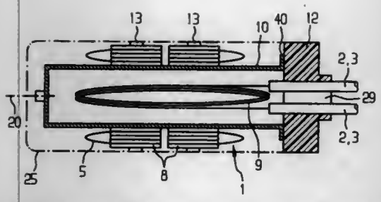


which the fastening pins are respectively introduced so that each splicing cassette is individually removable from the splicing block by a tilting motion.

5,815,630

TAPE DUBBING AND COPY GUARD SIGNAL INSERTING METHOD AND APPARATUS

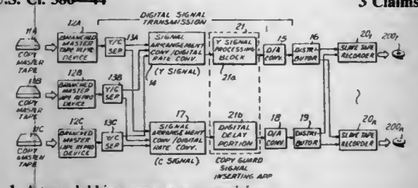
Yoich Sato, Ibaraki-ken, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 402,017, Mar. 10, 1995, abandoned. This application May 23, 1997, Ser. No. 862,577

Claims priority, application Japan, Sep. 29, 1994, 6-259128

Int. Cl.[6] H04N *9/825*

U.S. Cl. 386—44 **3 Claims**



1. A tape dubbing apparatus comprising:

a plurality N of branched master tape reproducing means for synchronously reproducing a corresponding one of branched master tapes respectively recorded with N branched master digital signals obtained by branching time-divisionally an original master signal by N and for outputting said N branched master digital signals, said original master signal having an original time series arrangement, where N is an integer greater than 1;

N-time speed recording digital video signal generating means for compressing said N branched master digital reproduced signals to 1/N in time and for generating a digital signal having the same time series arrangement as that of said original master signal;

copy guard signal generating means for generating an N-time normal speed, digital copy guard signal to allow a television receiver to perform normal color image reproduction and to prevent normal recording operation of a video recording device;

copy guard signal inserting means for inserting said copy guard signal into a vertical blanking period of said N-time speed recording digital video signal;

D/A converter for converting said N-time speed recording digital video signal having said copy guard signal inserted therein into an analog signal;

recording means for recording the output signal of said D/A converter on slave tape at a tape speed N times a normal tape speed without being affected by said copy guard signal; and

wherein said N-time speed recording digital video signal includes a luminance signal and a chroma signal, means for separating said luminance and chroma signals, and wherein said inserting means inserts said copy guard signal during a vertical blanking period of said separated luminance signal, and includes a chroma signal delay means for delaying said separated chroma signal with respect to said luminance signal by a time necessary for the insertion of said copy guard signal.

5,815,631

APPARATUS AND METHOD FOR CONTROLLING AN AUDIO VIDEO SYSTEMS

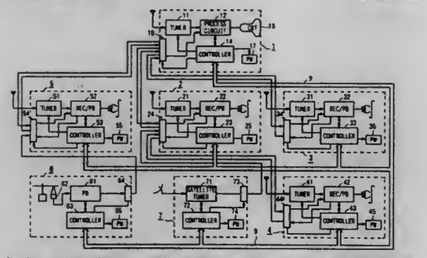
Koichi Sugiyama, Kanagawa; Noboru Motoyoshi, Tokyo; Hisato Shima, Kanagawa; Noriko Kotabe, Chiba; Makoto Sato, and Junichi Tsukamoto, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1995, Ser. No. 505,954

Claims priority, application Japan, Aug. 3, 1994, 6-201297

Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—46 **10 Claims**



1. A method for controlling an audio video system having at least three audio video devices which include a television receiver and a plurality of recording and/or reproducing units, each of said audio video devices having a controller coupled to each respective controller of at least another one of said audio video devices, in which at least one of said audio video devices transmits audio and video signals to at least one of the other audio video devices, said method comprising the steps of:

designating one of said audio video devices as a control audio video device;

sending information to the designated control audio video device from each of the other audio video devices which respectively identifies the other audio video devices and indicates a function or functions performable by the other audio video devices;

detecting whether a video signal is present on a signal path between said audio video devices; and

supplying a control signal from said control audio video device to each of the other audio video devices of said audio and video system so as to cause power to be turned off in the other audio video devices and causing power to be turned off in said control audio video device when said video signal is absent from said signal path.

5,815,632

APPARATUS FOR VIDEO SIGNAL PROCESSING

Makoto Furuhashi, Kangawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 598,161, Feb. 7, 1996, abandoned, which is a continuation of Ser. No. 154,626, Nov. 18, 1993, abandoned. This application Sep. 11, 1997, Ser. No. 928,011

Claims priority, application Japan, Nov. 19, 1992, 4-310272

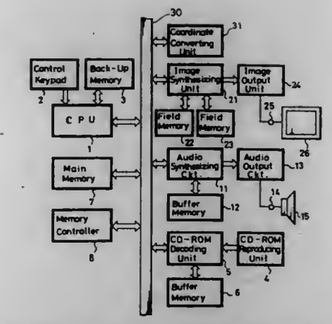
Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—46 **13 Claims**

2. An apparatus for video signal processing for making an image from image data that contains at least modelling data, said apparatus comprising:

control means for controlling an operation for making an image and representing said modelling data as polygons having apexes;

an odd field memory controlled by said control means, said odd field memory including one odd bit for storing a vertical direction coordinate of an apex of a polygon in an odd field when said vertical direction coordinate of said apex in said odd field is located between odd-numbered horizontal scanning lines of said odd field and on an even-numbered horizontal scanning line of an adjacent even field;



an even field memory controlled by said control means, said even field memory including one even bit for storing a vertical direction coordinate of an apex of a polygon in an even field when said vertical direction coordinate of said apex in said even field is located between even-numbered horizontal scanning lines of said even field and on an odd-numbered horizontal scanning line of an adjacent odd field;

coordinate converting means controlled by said control means for converting coordinate data including modelling data for said odd field and modelling data for said even field into image data for said odd and even field memories, said modelling data for said odd field including said vertical direction coordinate for said odd field, and said modelling data for said even field including said vertical direction coordinate for said even field;

image synthesizing means controlled by said control means for alternately reading data from said odd field memory of said odd field and from said even field memory of said even field at a field period to synthesize an image to be displayed in an interlace fashion and for producing display data, said synthesizing means processing said one odd bit included in said odd field memory to produce a half-line vertical shift in an apex of said display data for a corresponding odd field so that a vertical position of said apex located between odd-numbered horizontal scanning lines in said image to be displayed is accurately maintained in every odd field, and said synthesizing means processing said one even bit included in said even field memory to produce a half-line vertical shift in an apex of said display data for a corresponding even field so that a vertical position of said apex located between even-numbered horizontal scanning lines in said image to be displayed is accurately maintained in every even field; and

output means for outputting said display data from said image synthesizing means as a video signal for display.

5,815,633

MULTI-SCENE RECORDING MEDIUM AND APPARATUS FOR REPRODUCING DATA THEREFROM

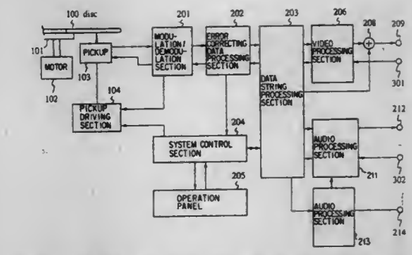
Koichi Hirayama, Yokohama; Masatoshi Nakai, Kawasaki, and Kenji Shimoda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 454,289, Jun. 15, 1995, Pat. No. 5,630,006. This application Aug. 8, 1996, Ser. No. 694,021

Int. Cl.[6] H04N *5/91;7/08;5/781*

U.S. Cl. 386—92 **21 Claims**

1. An apparatus for reproducing information from a multi-scene recording medium including a disk having a management area and a data area, said data area recording a first program information item, a second program information item following said first program information item, a third program information item following said second program information item, and a fourth program information item representing scenes simultaneously proceeding with scenes represented by said second program information item, said second and fourth program information items being alternatingly and continuously recorded physically one after another



between said first and third program information items on said recording medium, said apparatus comprising:

information reproducing means for reading said second and fourth program information items from said disk at a high speed after said first program information item has been read, and for simultaneously reproducing said second and fourth program information items.

5,815,634

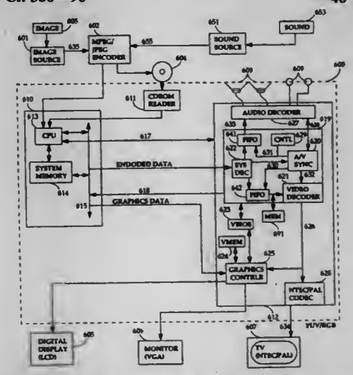
STREAM SYNCHRONIZATION METHOD AND APPARATUS FOR MPEG PLAYBACK SYSTEM

Daniel T. Daum; Mark A. Rosenau, both of San Jose, Calif.; Jeffrey G. Ort, Kirkland, Wash.; Richard Chang, San Jose, Calif.; Chih-Ta Sung, Princeton, N.J., and Tzoyao Chan, San Jose, Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 316,015, Sep. 30, 1994, Pat. No. 5,594,660. This application Dec. 14, 1994, Ser. No. 358,610

Int. Cl.[6] H04N *5/928;7/12*

U.S. Cl. 386—96 **46 Claims**



1. An apparatus for controlling playback of audio and video signals from an encoded data stream comprising at least audio data packets, video data packets, audio presentation time stamps and video presentation time stamps, said apparatus comprising:

a system decoder for receiving the encoded data stream and separating said data stream into an encoded audio data stream comprising at least audio data packets and audio presentation time stamps and an encoded video data stream comprising at least said video data packets and video presentation time stamps;

a first audio presentation time stamp detector, coupled to said system decoder, for detecting the presence of an audio presentation time stamp in the encoded audio data stream;

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a system time clock counter for receiving a start count, incrementing said start count according to a predetermined clock frequency and outputting a system time clock;

a video decoder, coupled to said system decoder and said system time clock counter, for receiving said system time clock and said encoded video data stream and decoding said encoded video data stream in synchronization with said system time clock;

an audio decoder for receiving said audio data packets from the encoded audio data stream and decoding said audio data packets;

a second audio presentation time stamp detector, coupled to said audio decoder, for detecting the presence of an audio presentation time stamp in the encoded audio data stream and outputting a load signal to said system time clock counter when audio data packets corresponding to said audio presentation time stamp are decoded; and

a step controller, coupled to said system time clock counter, said first audio presentation time stamp detector, and said audio decoder, for receiving a step control signal and allowing input of a start count to said system time clock counter from an external source.

5,815,635

IDENTIFICATION CODE PROCESSING APPARATUS FOR DIGITAL VCR

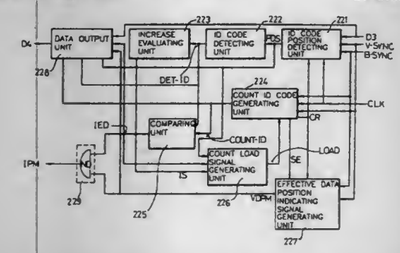
Yoon-Seok Seoh, Kyungki-Do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Continuation of Ser. No. 534,594, Sep. 27, 1995, abandoned. This application Aug. 14, 1997, Ser. No. 909,078

Claims priority, application Rep. of Korea, Sep. 28, 1994, 24571/1994

Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—113 **18 Claims**



7. An identification code processing apparatus for a digital video tape recorder comprising:

means for adding identification codes to video data and outputting marking signals;

means for generating corresponding identification codes to said added identification codes;

means for detecting, based on said marking signals, said added identification codes;

means for comparing said detected identification codes with said corresponding identification codes and outputting a comparison result; and

means for correcting said added identification codes using said corresponding identification codes based on said comparison result.

5,815,636

IMAGE REPRODUCING APPARATUS

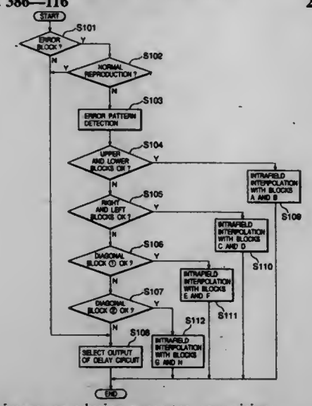
Akio Fujii, Yokohama, and Hidenori Hoshi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 218,928, Mar. 28, 1994, abandoned. This application Jul. 24, 1997, Ser. No. 899,885

Claims priority, application Japan, Mar. 29, 1993, 5-093554; Mar. 31, 1993, 5-096859; Mar. 31, 1993, 5-096871

Int. Cl.[6] H04N *5/76;5/92*

U.S. Cl. 386—116 **26 Claims**



1. An image reproducing apparatus, comprising:

(a) reproducing means for reproducing an image signal from a recording medium to provide a reproduced image signal divided into blocks each including a plurality of pixels;

(b) error correcting means for correcting an error in the reproduced image signal;

(c) constructing means for constructing a replacement block of the image signal for an error block including an error which cannot be corrected by said error correcting means by using blocks adjacent to the error block; and

(d) control means for detecting error correction results of each of the blocks adjacent to the error block and determining the blocks to be used by said constructing means among the blocks adjacent to the error block according to the error correction results of each of the blocks adjacent to the error block.

5,815,637

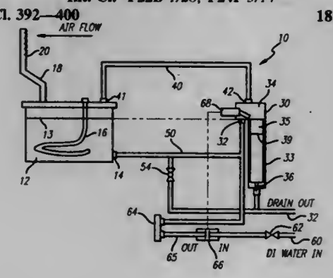
HUMIDIFIER FOR CONTROL OF SEMI-CONDUCTOR MANUFACTURING ENVIRONMENTS

Stuart V. Allen, Gilroy, and Robert Bruce Eglinton, Carmel, both of Calif., assignors to Semifab Corporation, Hollister, Calif.

Filed May 13, 1996, Ser. No. 645,341

Int. Cl.[6] F22B *1/28;* **F24F** *3/14*

U.S. Cl. 392—400 **18 Claims**



15. A humidifier for controlling humidity in a semi-conductor manufacturing environment, comprising:

a steam humidifier having a water tank with a water inlet port, a heater for generating steam from water in the water tank, and a steam distribution tube connected to the water tank for distributing steam in the semi-conductor manufacturing environment;

a water overflow tank having an upper air reservoir portion and a lower water containing portion, a water inlet port disposed at a lower portion of the air reservoir, and a float valve disposed at a lower portion of the lower water containing portion connected to a drain;

a pressure equalization line connected in fluid communication between an upper portion of the humidifier tank and the air reservoir of the water overflow tank;

a conduit connected in fluid communication between the humidifier tank inlet port and the water overflow tank inlet port; and

a water supply in fluid communication with the conduit for providing a substantially constant rate of flow of water to said steam humidifier water tank.

5,815,638

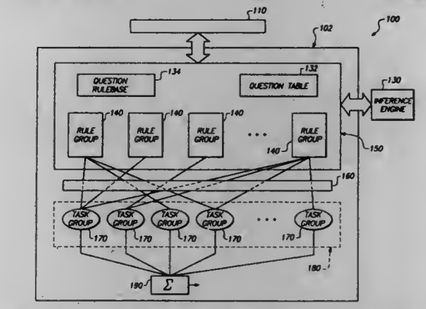
PROJECT ESTIMATOR

Frederick P. Lenz, East Setauket, and Francis Wang, New York, both of N.Y., assignors to Client/Server Connection, Ltd., Rye, N.Y.

Filed Mar. 1, 1996, Ser. No. 599,359

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—21 **8 Claims**



1. A method for estimating an effort required to implement a client/server system having user-specified properties, the method comprising the steps of:

associating a plurality of related tasks into a one of a plurality of task groups;

defining a neural network having a plurality of neurodes, each neurode associated with one of said task groups;

assigning a baseline effort value to each task group;

receiving system information, from a user, relating to the user-specified properties of the client/server system;

applying rule groups of an expert system to the system information to determine an effort factor with each user-specified property, said effort factor representing the potential impact of each user-specified property on each of said task groups;

automatically determining a plurality of influence factors, each influence factor representing a correlation between one of said rule groups and one of said task groups;

determining a task group value for each task group based upon said baseline value associated with each task group, said effort factors, and said influence factors, said task group value representing an estimate of the effort required to perform the tasks in each task group; and

combining said task group values to generate a system estimation value representing an estimate of the effort required to implement a client/server system having user-specified properties.

5,815,639

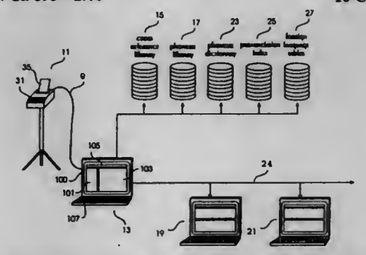
COMPUTER-AIDED TRANSCRIPTION SYSTEM USING PRONOUNCEABLE SUBSTITUTE TEXT WITH A COMMON CROSS-REFERENCE LIBRARY

James D. Bennett, Chicago, and Lawrence M. Jarvis, Wheaton, both of Ill., assignors to Engate Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 036,488, Mar. 24, 1993, Pat. No. 5,369,704. This application May 20, 1993, Ser. No. 65,163

Int. Cl.[6] G10L *9/00*

U.S. Cl. 395—2.44 **16 Claims**



1. A reporting system for providing in real-time to a viewing terminal text representative of spoken words that is readable by a lay person, said reporting system operates on coded representations of spoken words in a first phoneme format generated in real time, said reporting system comprising:

a cross-reference library storing associations between coded representations of spoken words in the first phoneme format and corresponding exact alphabetic and numeric text;

a phoneme library for storing associations between coded representations of spoken words in the first phoneme format and pronounceable but not exact representations of spoken words in a second phoneme format;

a transcriber retrieving from said cross-reference library exact alphabetic and numeric text for coded representations of spoken words in the first phoneme format that have associations stored in said cross-reference library;

said transcriber retrieving from said phoneme library coded representations of spoken words in the second phoneme format that are pronounceable by a lay person using coded representations of spoken words in the first phoneme format for which said cross-reference library stores no associations; and

communication means for delivering both the exact alphabetic and numeric text and the coded representations of spoken words in the second phoneme format to the viewing terminal for display.

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5,815,640

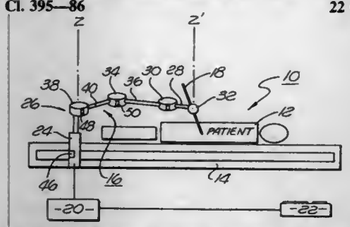
AUTOMATED ENDOSCOPE SYSTEM FOR OPTIMAL POSITIONING

Yulun Wang, Goleta, and Keith Phillip Laby, Santa Barbara, both of Calif., assignors to Computer Motion, Inc., Goleta, Calif.

Continuation of Ser. No. 613,866, Mar. 11, 1996, which is a continuation of Ser. No. 072,982, Jun. 3, 1993, Pat. No. 5,524,180, which is a continuation-in-part of Ser. No. 005,604, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 927,801, Aug. 10, 1992, abandoned. This application Jul. 31, 1997, Ser. No. 903,914

Int. Cl.[6] A61B *1/00;* **A61C** *19/04*

U.S. Cl. 395—86 **22 Claims**



1. A method for moving an instrument that is inserted into a patient, comprising the steps of:

a) attaching the instrument to an end effector of a robotic arm assembly located within a first coordinate system having a first x axis, a first y axis and a first z axis, said robotic arm assembly being adapted to move said end effector relative to the patient in response to an input command from the user, said end effector being located within a second coordinate system having a second x axis, a second y axis and a second z axis;

b) inserting the instrument into the patient, wherein the instrument is located within a third coordinate system having a third x axis, a third y axis and a third z axis;

c) inputting a command to move the instrument a distance in the third coordinate system;

d) computing a moving distance of the instrument in the second coordinate system from the distance commanded in step (c);

e) computing a moving distance of the instrument within the first coordinate system from the moving distance computed in step (d); and,

f) moving said robotic arm assembly until the instrument has moved the moving distance computed in step (e).

5,815,641

SPATIAL LIGHT MODULATOR WITH IMPROVED PEAK WHITE PERFORMANCE

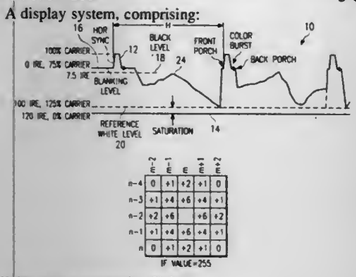
Stephen W. Marshall, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 27, 1996, Ser. No. 671,468

Int. Cl.[6] G06F *15/00;* **H04N** *9/74;* **G09G** *5/36*

U.S. Cl. 395—108 **3 Claims**

1. A display system, comprising:



a light source generating light;

a spatial light modulator having an array of pixels modulating said light in response to processed video data to display a video image on a viewing surface; and

processing circuitry processing an incoming stream of video data to provide said processed video data by determining if first data for a first said pixel corresponds to saturation of said pixel, then increasing said video data for pixels neighboring said first pixel to create a bloom effect about said first pixel.

5,815,642

IMAGE PROCESSING APPARATUS AND METHOD

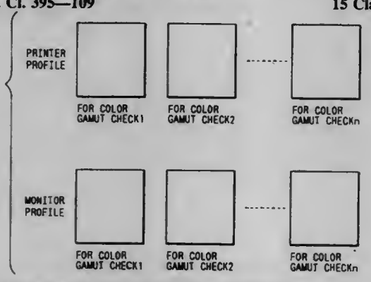
Shuichi Kumada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 380,620, Jan. 30, 1995, abandoned. This application Jun. 10, 1997, Ser. No. 872,041

Claims priority, application Japan, Jan. 31, 1994, 6-009886; Jan. 24, 1995, 7-008949

Int. Cl.[6] G03F *3/08*

U.S. Cl. 395—109 **15 Claims**



1. An image processing apparatus comprising:

designating means for designating a type of color gamut check algorithm and an output device model for a color gamut check;

setting means for setting information indicating a color gamut of the output device model in accordance with a designated type of color gamut check algorithm and a designated output device model; and

checking means for checking, on the basis of the information, whether input color image data is within the color gamut of the designated output device model.

5,815,643

PRINTING SYSTEM

Hendrikus J. G. Van Deurzen, Budel; Gerardus J. M. Geurts, Kronenberg; Wilhelmus H. M. Orbons, Grubbenvorst, and Jurek N. Deen, Venlo, all of Netherlands, assignors to Oce-Nederland, B.V., MA Venlo, Netherlands

Filed Dec. 8, 1995, Ser. No. 569,993

Claims priority, application Netherlands, Dec. 9, 1994, 9402088; Jul. 3, 1995, 1000719

Int. Cl.[6] B41B *15/00;* **G06K** *9/20;* **H04M** *11/00;* **G03G** *15/00*

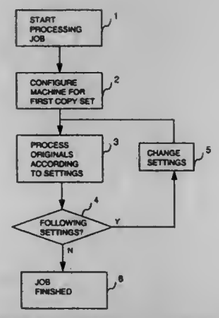
U.S. Cl. 395—112 **26 Claims**

1. A printing system for processing a set of original images into at least two disparate copy sets thereof during a production run in accordance with a job specification, the printing system comprising:

storage means for storing the set of original images supplied to the printing system;

programming means for programming the printing system in accordance with the job specification for the production run, the job specification including the at least two copy set specifications, one copy set specification per copy set to be formed; and

control means for repeatedly processing, during the production run, the set of original images according to the job specification to produce the at least two disparate copy sets corresponding to the copy set specifications of the job specification.



5,815,644

DEVELOPING FRAME, PROCESS CARTRIDGE AND IMAGE FORMING APPARATUS

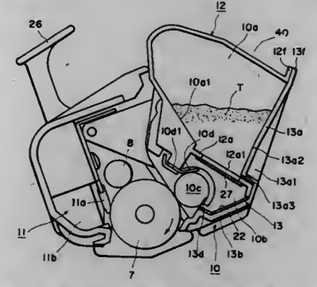
Tsutomu Nishiuwatoko, Tokyo; Kouji Miura, Sagamihara, and Kazuhiko Kanno, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 430,808, Apr. 26, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 783,294

Claims priority, application Japan, Apr. 28, 1994, 6-091185; Apr. 21, 1995, 7-096884

Int. Cl.[6] G03G *15/08*

U.S. Cl. 399—113 **121 Claims**



1. A developing frame usable in a process cartridge which is detachably mountable to an image forming apparatus, the process cartridge having an electrophotographic photosensitive member and a developing roller for developing a latent image formed on the electrophotographic photosensitive member, said developing frame comprising:

a first frame having a toner containing portion for containing toner for developing a latent image formed on the photosensitive member, said toner containing portion being provided with an opening portion and a toner supply opening for supplying the toner from said toner containing portion to a developing zone where the developing roller is provided; and

a second frame having a first covering portion for covering a part of a circumferential surface of the developing roller in a longitudinal direction of the developing roller, and a second covering portion for covering the opening portion of the toner containing portion;

wherein said developing frame is constructed by combining said first frame and second frame.

5,815,645

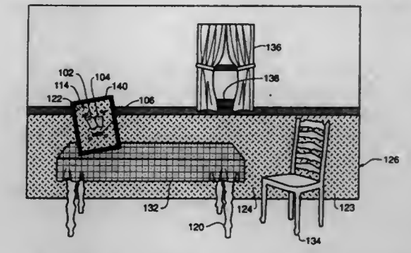
METHOD OF COMBINING TWO DIGITAL IMAGES

John Randall Fredlund, and Ronald Steven Cok, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1996, Ser. No. 681,755

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—117 **14 Claims**



1. A method of combining at least one customer generated digital image and/or text with at least one prestored digital image to form a merged image to be displayed in association with another item, comprising the steps of:

a) selecting a prestored digital image, the prestored digital images having one or more predetermined locations where a customer generated digital image and/or text may be placed;

b) obtaining at least one customer generated digital image in digital form;

c) obtaining a design characteristic from an item to be displayed apart from and in association with the merged image; d) modifying one of the customer generated digital image or the prestored image in accordance with said design characteristic so as to form a first modified digital image; and

e) combining the first modified digital image with the other of the selected prestored digital image or customer generated digital image so as to form a newly merged digital image from which the merged image may be formed and displayed apart from and in association with said item.

5,815,646

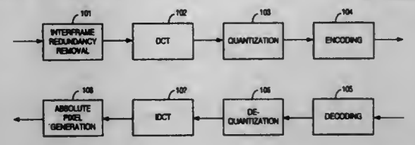
DECOMPRESSION PROCESSOR FOR VIDEO APPLICATIONS

Stephen C. Purcell, Mountain View; David E. Galbi, Santa Clara; Frank H. Liao, Sunnyvale, and Yvonne C. Tse, Fremont, all of Calif., assignors to C-Cube Microsystems, Milpitas, Calif.

Division of Ser. No. 46,474, Apr. 13, 1993, Pat. No. 5,379,356. This application Oct. 11, 1994, Ser. No. 296,387

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—163 **8 Claims**



1. A structure for processing a picture area of m×n pixels, comprising:

2r memory banks, each memory bank storing the values of pixels in one non-overlapping group of m/2r×n pixels in said picture area, m being greater than 1; and

r processors, r being greater than 1, each accessing two associated memory banks in addition to one memory bank associated with a right neighbor if present and one memory bank associated with a left neighbor if present, each processor

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being responsible for processing the pixels associated with two of said accessible memory banks.

5,815,647

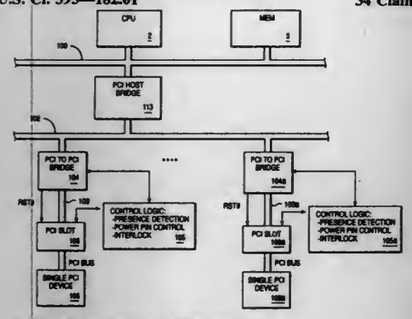
ERROR RECOVERY BY ISOLATION OF PERIPHERAL COMPONENTS IN A DATA PROCESSING SYSTEM

Patrick Allen Buckland, Austin; Danny Marvin Neal, Round Rock, and Steven Mark Thurber, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 556,887, Nov. 2, 1995, abandoned. This application May 23, 1997, Ser. No. 862,579

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.01 **34 Claims**



1. A computer system, comprising:

a plurality of feature cards for implementing data processing functions;

means for identifying a particular one of said plurality of feature cards which has issued an error signal;

a controllable bridge interface, connected between an I/O bus and at least one of the plurality of feature cards, and including means for preventing said error signal, issued by said particular one of said plurality of feature cards, from being transmitted to said I/O bus by isolating said particular one of said plurality of feature cards from said I/O bus; and

means for resetting said particular one of said plurality of feature cards while the remaining plurality of feature cards continue said data processing activities.

5,815,648

APPARATUS AND METHOD FOR CHANGING THE CACHE MODE DYNAMICALLY IN A STORAGE ARRAY SYSTEM

Federico Antonio Giovannetti, Ocean, N.J., assignor to ECCS, Inc., Tinton Falls, N.J.

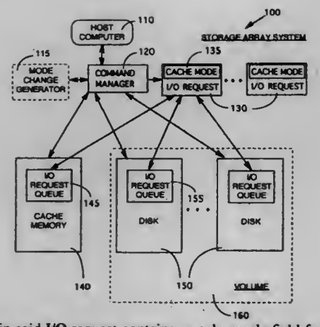
Filed Nov. 14, 1995, Ser. No. 557,613

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.03 **13 Claims**

1. In a storage system containing a plurality of storage elements, apparatus comprising:

a command manager for producing an I/O request in response to an I/O command generated by a host computer that is coupled to the command manager;



wherein said I/O request contains a cache mode field for receiving one of a plurality of operational modes from said command manager.

5,815,649

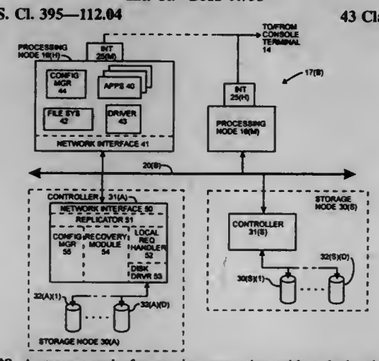
DISTRIBUTED FAULT TOLERANT DIGITAL DATA STORAGE SUBSYSTEM FOR FAULT TOLERANT COMPUTER SYSTEM

David A. Utter, Princeton; Susan J. Lo Verso, Southborough; Laurie E. Friedman, Westborough; Steven Hald, Bolton; Gregory S. LeBlanc, Lunenburg, and Paul H. Hansen, Marlborough, all of Mass., assignors to Stratus Computer, Inc., Marlboro, Mass.

Filed Oct. 20, 1995, Ser. No. 546,234

Int. Cl.[6] G01F *11/08*

U.S. Cl. 395—112.04 **43 Claims**



28. A storage node for use in connection with a fault-tolerant computer system comprising at least one processing node and a plurality of storage nodes interconnected by a network, the processing node performing processing operations in connection with user-generated processing requests, in connection with processing a processing request generating storage and retrieval requests for transmission over the network to enable storage of data on and retrieval of data from respective ones of said storage nodes, the storage nodes storing data in at least one replicated partition group comprising a plurality of replicated partitions distributed across the storage nodes, one of said replicated partitions of said at least one replicated partition group comprising a master partition and each other replicated partition of said at least one replicated partition group comprising a respective slave partition, the storage node maintaining the master partition and comprising:

A. a network interface for receiving storage requests from said network, the network interface further receiving replicated storage requests directed to the one of said storage nodes which maintains the master partition;

B. a replicator module for receiving storage requests from said network interface and broadcasting replicated storage requests to the storage nodes which maintain ones of the replicated partitions of the replicated partition group;

C. a local request handler for said receiving replicated storage requests directed to the one of said storage nodes which maintains the master partition, and in response thereto updating the master partition.

5,815,650

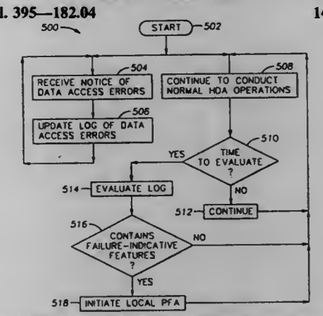
EFFICIENT SYSTEM FOR PREDICTING AND PROCESSING STORAGE SUBSYSTEM FAILURE

Norman Apperley, Chandlers Ford, England; James Thomas Brady; Steven Gerdt, both of San Jose, Calif., and Alden B. Johnson, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 614,427, Mar. 12, 1996, Pat. No. 5,717,850. This application Jun. 23, 1997, Ser. No. 880,731

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.04 **14 Claims**



1. A method for operating a storage system, the storage system including a supervising processor coupled to at least one head disk assembly ("HDA"), each HDA including an HDA controller and at least one storage medium, wherein the processor accesses the at least one HDA at selected times to exchange data therewith, said method comprising the steps of:

a first HDA of the at least one HDA determining whether a first predetermined time has elapsed since a most recent access of the first HDA by the processor;

if the first predetermined time has elapsed, the first HDA performing a selected predictive failure analysis ("PFA") to predict future failure of the at least one storage medium of the first HDA; and

if the first predetermined time has not elapsed, the first HDA refraining from performing any PFA.

5,815,651

METHOD AND APPARATUS FOR CPU FAILURE RECOVERY IN SYMMETRIC MULTI-PROCESSING SYSTEMS

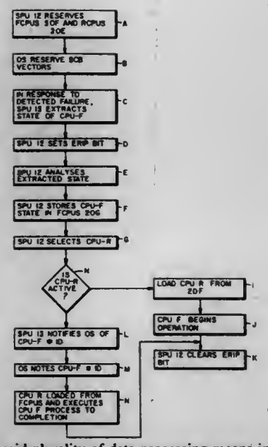
Timothe Litt, Southboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 415,218, Mar. 28, 1995, abandoned, which is a continuation of Ser. No. 264,803, Jun. 23, 1994, abandoned, which is a continuation of Ser. No. 778,030, Oct. 17, 1991, abandoned. This application Sep. 6, 1996, Ser. No. 711,386

Int. Cl.[6] G06F *11/00;9/00*

U.S. Cl. 395—182.08 **23 Claims**

1. A method of operating a symmetric multi-processing data processing system having a plurality of data processing means coupled to an error recovery control means and additionally coupled to a shared memory, said method comprising the steps of:



operating said plurality of data processing means in response to a control program stored in said shared memory;

in response to a failure of one of said data processing means:

detecting, by said error recovery control means, that one of the data processing means has failed during execution of a first process;

extracting, by said error recovery control means, upon detection of said failure, an internal processing state from the failed data processing means, said internal processing state comprising a plurality of register state data, wherein associated with each of said plurality of data processing means is an identifier for indicating an identity of the associated data processing means to processes and external devices, wherein the internal processing state includes an identifier associated with said failed data processing means, and wherein one or more system resources are owned by said failed data processing means, said ownership accomplished by one or more software spinlocks, each of said software spinlocks associated with a respective one of said one or more system resources, said software spinlocks only releasable by a data processing means having an associated identifier equal to the identifier associated with said failed data processing means;

loading by said error recovery control means the extracted internal processing state into a second one of said plurality of data processing means, wherein the step of loading includes the step of copying said identifier associated with said failed data processing means into said second data processing means to allow said second processing means to assume the identity of the failed data processing means in order to release said software spinlocks and in order to handle processor interrupt requests for said failed data processing means;

continuing the execution of said first process associated with said failed data processing means by the second data processing means so as to achieve an orderly removal of the failed data processing means from a set of active data processing means, said continued execution including releasing said one or more spinlocks associated with said ownership of said one or more system resources, thereby releasing ownership of said one or more system resources; and

handling, by said second data processing means, processor interrupt requests for said failed data processing means.

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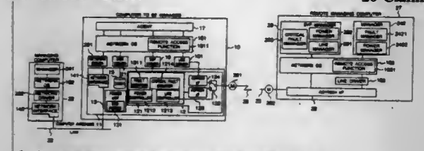
5,815,652

COMPUTER MANAGEMENT SYSTEM

Ichiro Ote, Chigasaki; Hiroshi Furukawa, Yokohama; Hiroaki Washimi, Chigasaki; Yuichi Kobayashi, Kawasaki; Shigeru Sakurai, Zama; Teiji Karasaki; Yuji Miyagawa, both of Owariasahi; Masami Murai, Hadano, and Tsunehiro Tobita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1996, Ser. No. 655,482
Claims priority, application Japan, May 31, 1995, 7-133177
Int. Cl.[6] G01F *11/30*
U.S. Cl. 318—143.07 20 Claims



1. A computer management system comprising:

at least two computers connected by a network;

a network operating system (OS) adapted to be executed on each of said computers for controlling data transfer between the computers connected to said network and a file system service on said network;

a manager operating on at least one computer serving as a management computer, of said computers connected by said network, for managing at least configuration and fault of the other computer as a computer to be managed, of said computers connected by said network;

an agent on said computer to be managed, for monitoring information on said computer to be managed and controlling said computer to be managed in accordance with an instruction from said manager sent through said network;

an extended board, connected to an I/O bus of said computer to be managed, said extended board including a processor independent from said computer to be managed for monitoring the occurrence of fault in said computer to be managed, sending fault information to said agent through said I/O bus and a service processor (SVP) for controlling a power supply of said computer to be managed by an instruction from said agent; and

a sub-power supply for continuously and constantly supplying power to said extended board independently of the power supply to said computer to be managed.

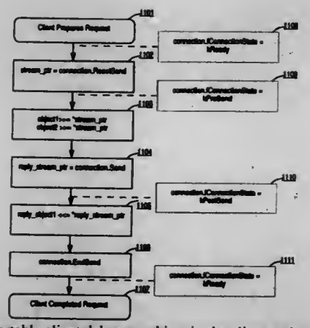
5,815,653

DEBUGGING SYSTEM WITH PORTABLE DEBUG ENVIRONMENT-INDEPENDENT CLIENT AND NON-PORTABLE PLATFORM-SPECIFIC SERVER

Lawrence L. You, 4603 Clarendon Dr.; Narayan Rajgopal, 1020 Whitebick Dr., both of San Jose, Calif. 95129, and Michael D. Wimble, 1144 Snowberry Ct., Sunnyvale, Calif. 94087

Filed Nov. 13, 1995, Ser. No. 557,989
Int. Cl.[6] G06F *9/44*
U.S. Cl. 395—183.14 19 Claims

1. A portable debugging system controllable by a user working at a client node for debugging one or more target processes, each of the target processes running on an associated platform-specific server node connected to the client node over a network wherein different server nodes can run on different platforms, the portable debugging system comprising:



(a) a portable client debugger object in the client node, the client debugger object having sender logic which transmits debug environment-independent debug requests over the network under control of the user and receiver logic which receives debug environment-independent debug results; and

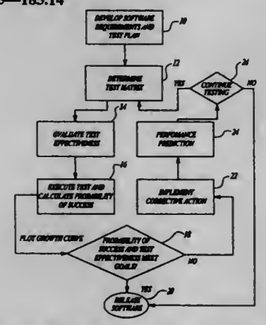
(b) a non-portable server debugger object in each server node operating with the client debugger object, each server debugger object including platform-specific debugging logic which receives from the network the debug environment-independent debug requests generated by the client debugger object and performs a platform-specific debug operation on a target process running in the server node, which debug operation generates platform-specific results and answer logic which responds to the plafform-specific results by returning debug environment-independent debug results to the client debugger object.

5,815,654

METHOD FOR DETERMINING SOFTWARE RELIABILITY

John Bieda, Waterford, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Oct. 16, 1996, Ser. No. 732,624
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—183.14 9 Claims



1. A method for predicting an error rate of a computer software product having a total number of input combinations, comprising the steps of:

determining a test number of input combinations, the test number of input combinations being a subset of the total number of input combinations;

determining an effectiveness ratio of the test number of input combinations to the total number of input combinations;

testing the computer software program for each of the test number of input combinations to render a number of successful tests;

determining a success ratio of the number of successful tests to the test number of input combinations; and

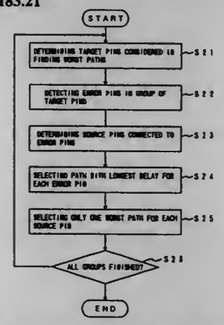
determining whether to undertake further testing of the software based on the effectiveness and success ratios.

5,815,655

DEVICE FOR GENERATING ERROR PATH LIST AND METHOD OF EXTRACTING THE WORST PATHS

Akira Koshiyama, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 418,573, Apr. 6, 1995, abandoned.
This application Feb. 28, 1997, Ser. No. 808,672
Claims priority, application Japan, May 13, 1994, 6-099749
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—183.21 11 Claims



11. A method for performing delay time analysis of a logic circuit, comprising:

(a) grouping nodes of the logic circuit into a plurality of node groups;

(b) selecting a representative path for each possible pair of node groups using path delay times between the nodes to determine a worst delay path;

(c) selecting a source node group and a target node group from the node groups; and

(d) determining a representative path between said source node group and said target node group by,

(d1) determining a first worst delay path by finding a longest delay path from a source pin to each source node of said source node group,

(d2) determining a second worst delay path by finding a longest delay path from a target pin to each target node of said target node group, and

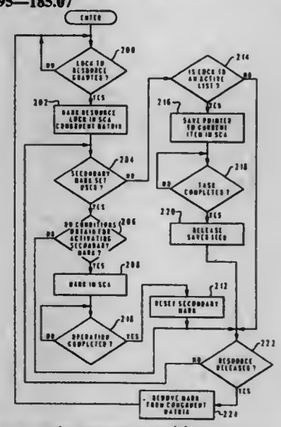
(d3) determining said representative path by concatenating the first worst delay path and second worst delay path.

5,815,656

METHOD OF VALIDATING MEMORY STRUCTURES IN DATA PROCESSING SYSTEMS

Susan Kay Candelaria; Michael Howard Hartung, both of Tucson, Ariz.; Dennis Albert Kukula, Henderson, Nev.; Kenneth Wayne Lane; Vernon John Legvold, both of Tucson, Ariz.; Guy Eugene Martin, Austin, Tex.; John Norbert McCauley, Jr., Tucson, Ariz.; Carol Santich Michod, Tucson, Ariz.; Mark Albert Reid, Tucson, Ariz., and William Lee Richardson, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1992, Ser. No. 949,668
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—185.07 14 Claims



1. A data processing system comprising:

processor means for executing parallel processes;

memory means connected to the processor means for storing a plurality of data structures for serial access by the parallel processes;

means coupled to the memory means for indicating access to a selected data structure by a first parallel process;

means coupled to said processor means and responsive to a fault occurring in the first parallel process for signalling the fault to a remaining parallel process; and

the remaining parallel process including means responsive to the signalling of a fault for determining from the selected data structure if the first parallel process had access to the selected data structure at the time of the fault.

5,815,657

SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR NETWORK ELECTRONIC AUTHORIZATION UTILIZING AN AUTHORIZATION INSTRUMENT

Humphrey Williams, Palo Alto; Kevin Hughes, San Mateo, and Bipinkumar G. Parmar, Cupertino, all of Calif., assignors to VeriFone, Inc., Redwood City, Calif.

Filed Apr. 26, 1996, Ser. No. 638,355
Int. Cl.[6] G06F *17/60*
U.S. Cl. 395—186 26 Claims

1. A method for initiating authorization in a computer with an attached display the computer being coupled to a network for receiving and transmitting network information, the method comprising the steps of:

(a) coupling the computer, via the network, to a network site remotely located away from the computer;

(b) communicating, via the network, information between the network site and the computer;

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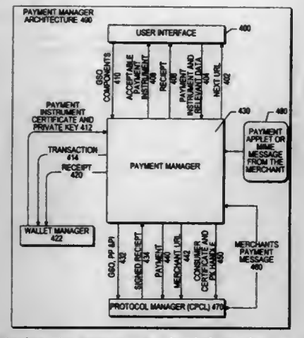


(c) displaying, in response to the information, at least one payment instrument as a bitmap image of the payment instrument;

(d) selecting a payment instrument from the at least one payment instrument using the bitmap image; and

(e) utilizing information associated with said payment instrument for processing across the network whereby a transaction is processed through the network site and authorization for the transaction is obtained.

5,815,658

PORTABLE TERMINAL APPARATUS FOR IC CARD COMPATIBLE WITH A PLURALITY OF APPLICATIONS

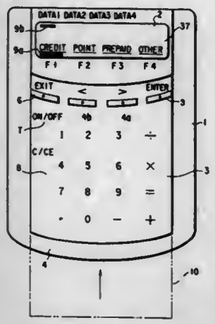
Ryouichi Kuriyama, Zushi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1997, Ser. No. 791,782

Claims priority, application Japan, Mar. 25, 1996, 8-067962

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—186 **11 Claims**



1. A data processing apparatus for an integrated circuit medium, comprising:

means for receiving and accessing the integrated circuit medium storing data;

first processing means for performing data processing for the integrated circuit medium on the basis of a first application;

second processing means for performing data processing for the integrated circuit medium on the basis of a second application different from the first application;

means for inputting an instruction concerning data processing of the integrated circuit medium;

means for selecting one of the first processing means and the second processing means in accordance with the instruction input from the inputting means; and

means for controlling one of the first processing means and the second processing means which is selected by the selecting means so as to perform data processing.

5,815,659

NETWORK DATA SERVER FOR USE WITH PROGRAMMABLE LOGIC CONTROLLERS AND PROGRAMMABLE LOGIC CONTROLLER SYSTEM FORMED USING SUCH NETWORK DATA SERVERS

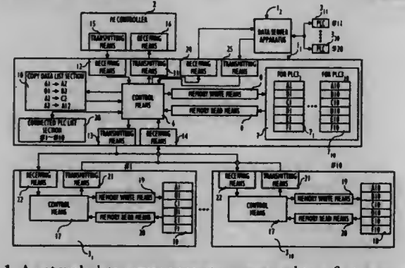
Minoru Umetsu; Koji Morita, and Toshiyuki Takase, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1996, Ser. No. 583,502

Claims priority, application Japan, Jun. 7, 1995, 7-140508

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.33 **7 Claims**



1. A network data server apparatus connected to a first program processing means and a second program processing means in a manner enabling bidirectional communications, the network data server apparatus comprising:

a memory for storing, at specified memory addresses therein, data from the first program processing means;

a receiving means for receiving data transmitted from the first program processing means;

a write means for writing to said memory data received by said receiving means;

a read means for reading out data written in said memory;

a transmitting means for transmitting data read out by said read means to the second program processing means;

a copy data list section which contains a correspondence of memory addresses from which data is copied and memory addresses to which data is copied; and

a control means for causing said read means to read out from said memory, as copy data, data located at said memory addresses from which data is copied, according to the correspondence contained in said copy data list section, and causing said write means to write the copy data into said memory at said memory addresses to which data is copied, according to the correspondence contained in said copy data list section.

5,815,660

MASTER STATION STOPS POLLING A SLAVE STATION IF DETECTING NO COMMUNICATION OR RECEIVING A STOP POLLING REQUEST FROM THE SLAVE STATION

Morihisa Momona, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

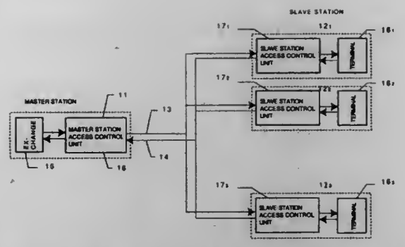
Filed May 10, 1996, Ser. No. 644,517

Claims priority, application Japan, May 11, 1995, 7-112836

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.38 **20 Claims**

1. A multiple access system having a master station, at least one slave station, a broadcasting channel for transmitting a signal from said master station to said slave station and a multiple access channel for broadcasting a signal from said slave channel to said



master station in which said master station communicates with said slave station based on a polling system, said master station comprises:

polling stop means for detecting whether a slave station is in communication and stopping polling for a slave station not in communication;

subscription polling transmission means for transmitting broadcasting type subscription polling; and

polling resume means for resuming polling for a slave station that has responded to said subscription polling; and said slave station comprises:

polling request means for transmitting a polling resume request to said master station,

responding to said subscription polling.

5,815,661

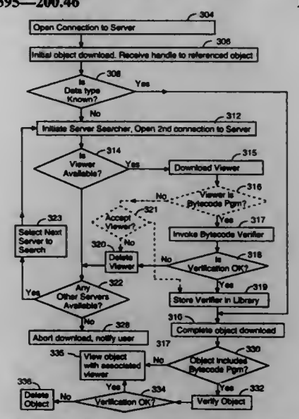
PLATFORM INDEPENDENT OBJECT AND OBJECT APPLICATION LOADER AND METHOD

James A. Gosling, Woodside, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 359,884, Dec. 20, 1994, Pat. No. 5,630,066. This application Feb. 20, 1997, Ser. No. 802,720

Int. Cl.[6] G06F *9/44;9/445*

U.S. Cl. 395—200.46 **13 Claims**



1. A method of operating a distributed computer system having a plurality of distinct computers, the method comprising steps of:

a) in a first computer, storing viewer programs, each viewer program enabling a user thereof to view objects of an associated data type;

b) in said first computer, enabling a user to select a reference to an object located in a second computer;

c) said first computer responding to user selection of said reference by establishing a first communication link between said first computer and said second computer and initiating retrieval of said object from said second computer including retrieving data type information associated with said object;

d) in said first computer, determining whether said viewer programs stored in said first computer include a viewer program associated with said retrieved data type;

e) when said determination in step (d) is negative, determining whether a viewer program associated with said retrieved data type is stored in said second computer;

f) when said determination in step (e) is positive, loading a copy of said viewer program associated with said retrieved data type into said first computer.

5,815,662

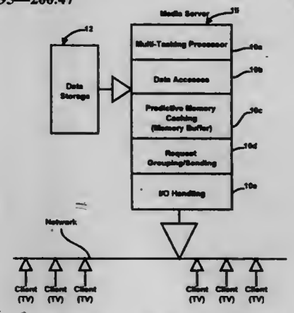
PREDICTIVE MEMORY CACHING FOR MEDIA-ON-DEMAND SYSTEMS

Lance Ong, 6 Post Rd., Monroe, N.Y. 10950

Filed Aug. 15, 1996, Ser. No. 698,099

Int. Cl.[6] H04N *9/79*

U.S. Cl. 395—200.47 **6 Claims**



1. A system for predictive memory caching for a media-on-demand network connected to a plurality of clients, comprising:

(a) a network server for handling requests from multiple clients for streaming media data for media programs provided by said system, said server being provided with a memory buffer;

(b) a data storage device associated with said network server for storing media data for media programs provided by said system;

(c) a server scheduler for allocating a plurality of sections of the memory buffer for requests for a given media program, wherein each buffer section can store one of a series of data blocks of predetermined size into which the media program is divided;

(d) said server scheduler having first process program means which, upon receiving requests from one or more clients constituting a first group of network clients for the media program within a first predetermined time interval TI_1, establishes a first streaming data process for sending the data blocks of the requested media program to the first group of clients, including process program means for checking for and, otherwise, for reading in a first data block of the requested media program from the data storage device in the server's memory buffer and for sending it to the first group of clients;

(e) said server scheduler having second process program means for sending a current data block to a current group of clients, and for checking for and, otherwise, for reading in a next data block of the media program in the server's memory buffer;

(f) said server scheduler having third process program means for checking if requests for the same media program have been made by another group of clients close enough in time to the first time interval TI_1 that the first data block of the large data file remains in memory, and for establishing a streaming data process for such group and sending the first data block to such group;

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(g) said server scheduler having fourth process program means for checking if the allocated sections of the memory buffer are full and, if so, for removing an oldest-in-time, lowest priority data block to free a section of the memory buffer;

wherein the operations of said second, third, and fourth process program means are performed iteratively until all data blocks of the requested large data file have been sent to the groups of clients for which the streaming data processes were established; and

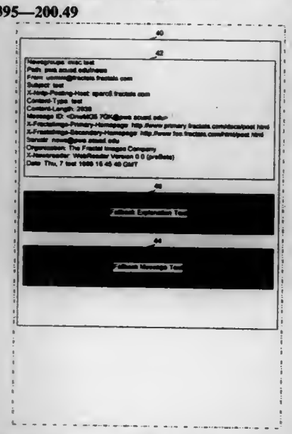
wherein said network server employs a microprocessor having a capacity for addressing up to 4 gigabytes of random access memory for the memory buffer which is capable of handling multiple accesses by a multiplicity of clients for "Top 10" video-on-demand service during Prime Time hours.

5,815,663

DISTRIBUTED POSTING SYSTEM USING AN INDIRECT REFERENCE PROTOCOL

Robert Uomini, Kensington, Calif., assignor to The Robert G. Uomini and Louise B. Bidwell Trust, Kensington, Calif.

Filed Mar. 15, 1996, Ser. No. 615,483
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—200.49 **12 Claims**



1. A method of posting articles to a news group in a news network, wherein the articles posted to the news group are directed to readers throughout the news network who choose to read the articles contained in the news group by interacting with a news server site of the news network, the method comprising the steps of:

authoring an article, where the article includes text with markup language formatting embedded in the text;

storing components of the article at a document server;

generating a reference pointer to the document server and a location thereon where the components of the article can be found;

adding the reference pointer to a header of a posting text message, wherein the posting text message is distinct from the article and is usable as a partial replacement for the article when the article is too complex to be transported and displayed on a recipient display; and

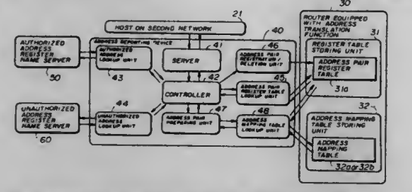
posting the posting text message to the news group.

5,815,664

ADDRESS REPORTING DEVICE AND METHOD FOR DETECTING AUTHORIZED AND UNAUTHORIZED ADDRESSES IN A NETWORK ENVIRONMENT

Kazuo Asano, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1996, Ser. No. 618,211
Claims priority, application Japan, Mar. 20, 1995, 7-060189
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.57 **25 Claims**



4. An address reporting method for returning when a query requesting an address corresponding to a machine name for a machine on a first network provided with a plurality of authorized addresses and a plurality of unauthorized addresses is issued from a second network, the requested address to the second network,

said address reporting method comprising the steps of:

a) receiving a query for the address from the second network;

b) determining whether or not the address corresponding to the machine name designated in the query received in step a) is one of the plurality of unauthorized addresses:

c) preparing, when it is determined through step b) that the address corresponding to the machine name designated in the query is the unauthorized address, an address pair formed by the unauthorized address and the one of the plurality of authorized addresses;

d) registering the address pair prepared in step c) in an address pair register table;

e) returning the authorized address forming the address pair to the second network, when it is determined through step b) that the address corresponding to the machine name is designated in the query is one of the plurality of unauthorized addresses;

f) determining, when it is determined that the address corresponding to the machine name designated in the query is one of the plurality of unauthorized addresses, whether or not the address pair that contains the unauthorized address corresponding to the host name designated in the query is registered in the address pair register table;

g) reading, when it is determined through step g) that the address pair that contains the unauthorized address corresponding to the machine name designated in the query is registered in the address pair register table, the authorized address forming the address pair from the address pair register table;

h) specifying, when it is determined through step f) that the address pair that contains the unauthorized address corresponding to the machine name designated in the query is not registered in the address pair register table, one of the plurality of authorized addresses not registered in the address pair register table; and

i) registering an address pair formed by the unauthorized address corresponding to the machine name designated in the query and the authorized address specified through step h) in the address pair register table, wherein

when the authorized address is read from the address pair register table through step h), the authorized address read is returned to the second network in step e), and

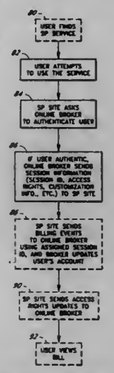
when the authorized address is specified through step h), the specified address is returned to the second network in step e).

5,815,665

SYSTEM AND METHOD FOR PROVIDING TRUSTED BROKERING SERVICES OVER A DISTRIBUTED NETWORK

Jeffrey A. Teper, Redmond; Sudheer Koneru, Northbend; Gordon Mangione; Rudolph Balaz, both of Redmond; Aaron M. Contorer, Kirkland, and Lucy Chao, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 3, 1996, Ser. No. 626,460
Int. Cl.[6] H01J *13/00*
U.S. Cl. 395—200.59 **46 Claims**



1. A method of providing an online service to a user over a public network, the online service provided by a Service Provider (SP) site to a user computer via the public network, the method comprising the steps of:

sending a request message from the user computer to the SP site over the public network to request the use of the online service;

generating a challenge message at the SP site in response to the request message and sending the challenge message over the public network to the user computer;

generating a response message in the user computer in response to the challenge message and sending the response message over the public network to the SP site, the response message including or being based upon an identifier of the user;

sending at least the response message from the SP site to a remote online broker site, the online broker site having a brokering database which contains account information of registered users of an online brokering service of the online broker site;

processing the response message at the remote online broker site to determine whether the response message is authentic, the step of processing comprising accessing the account information in the brokering database;

sending a verification message from the remote online broker site to the SP site, the verification message indicating whether the response message is authentic;

retrieving access rights data of the user from the brokering database if the response message is authentic, the access rights data specifies a plurality of content categories to which the user has access, the plurality of content categories corresponding to a plurality of different online services offered by the SP site;

sending the access rights data from the online broker site to the SP site;

providing the online service from the SP site to the user computer over the public network if the verification message indicates that the response message is authentic; and

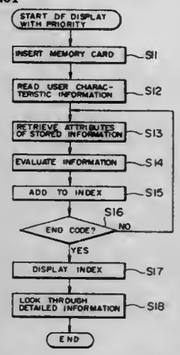
denying access by the user to the online service if the verification message indicates that the response message is not authentic.

5,815,666

INFORMATION SUPPLY SYSTEM

Akira Kurihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,749
Claims priority, application Japan, May 30, 1995, 7-131381
Int. Cl.[6] G06F *19/00*
U.S. Cl. 395—200.61 **20 Claims**



1. An information supply system which transmits multimedia information from a server to a plurality of user terminals, wherein information is transmitted, in only one direction, from said server to said user terminals such that said server transmits the same said multimedia information to each user terminal regardless of information normally transmitted from said user terminal to said server,

said server comprising:

addition means for adding classification information to said multimedia information indicating the type and importance of portions of said multimedia information;

transmission means for transmitting to each user terminal the same said multimedia information to which said classification information has been added;

a respective user terminal operated by a respective user comprising:

receiving means for receiving said multimedia information transmitted from said server;

input means for inputting user information about said respective user;

setting means for setting priorities for different portions of said multimedia information on the basis of comparing said user information to said classification information; and

display means for displaying said portions of multimedia information according to said priorities.

5,815,667

CIRCUITS AND METHODS FOR INTELLIGENT ACKNOWLEDGEMENT BASED FLOW CONTROL IN A PROCESSING SYSTEM NETWORK

Anthony H. Chien, and Jeffrey M. Donnelly, both of Holmdel, N.J., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 28, 1995, Ser. No. 563,477
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.62 **29 Claims**

1. A management circuit for governing transmission of reception indicia by a transmission circuit over a network, comprising:

a detector circuit operative to monitor a latency characteristic indicative, at least in part, of an efficiency level associated with transmission of said reception indicia by said transmission circuit; and

a control circuit, associated with said detector circuit and said transmission circuit, operative to adjust a transmission delay of said transmission of said reception indicia over said network as a function of said latency characteristic and a frequency of timeout occurrences to thereby allow said manage-

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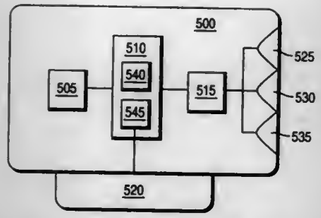


ment circuit to manage said transmission delay as a function of said efficiency level associated with said transmission circuit.

5,815,668

SLAVE INTER-LAN CONNECTION DEVICE, AN INTER-LAN CONNECTION SYSTEM AND A HOT STANDBY METHOD OF SAID INTER-LAN CONNECTION SYSTEM

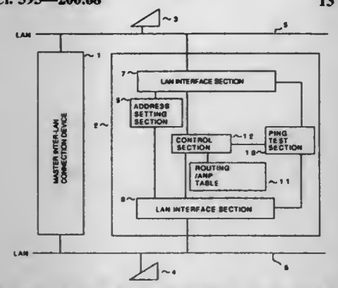
Akira Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 15, 1996, Ser. No. 616,342

Claims priority, application Japan, Mar. 17, 1995, 7-086133

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—200.68 **13 Claims**



1. A slave device, for interconnecting local area networks (LANs), connected to a route to which a master device for interconnecting said LANs is connected, said master device having respective routing information and respective correspondence information, said slave device comprising:

means for detecting a malfunction state of said master device;

means for generating respective routing information and respective correspondence information concurrently with and identical to said respective routing information and said respective correspondence information of said master device, said respective routing information corresponding to network information, said correspondence information corresponding to physical information;

means for inhibiting a routing operation of said slave device when said means for detecting does not indicate that said master device is in said malfunction state; and

means for enabling said routing operation of said slave device when said means for detecting indicates that said master device is in said malfunction state, said routing operation being based on said routing information and said correspondence information, said means for enabling defining a substitution means of said slave device.

5,815,669

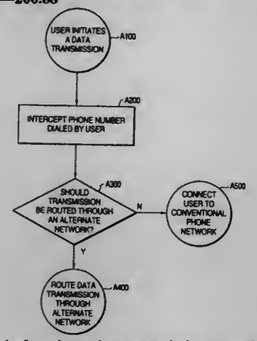
METHOD OF ROUTING A DATA TRANSMISSION

Warren S. Lee; David W. Copp, both of Jacksonville, Fla.; Dale T. Platteter, Pittsford, N.Y., and Neil P. Carrier, Jacksonville, Fla., assignors to NKO, Inc., Jacksonville, Fla.

Filed May 17, 1996, Ser. No. 649,208

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—200.68 **20 Claims**



1. A method of routing a data transmission comprising the steps of:

(a) receiving a destination number of said data transmission corresponding to a destination device directly reachable on a first communication network, said destination number not directly corresponding to a number on a second communication network;

(b) determining whether said data transmission should be routed through said second communication network and not through said first communication network; and

(c) routing said data transmission through said second communication network if step (b) determines said data transmission should be routed through said second communication network, wherein said data transmission is routed through said second communication network even though said data transmission is capable of being routed through said first communication network.

5,815,670

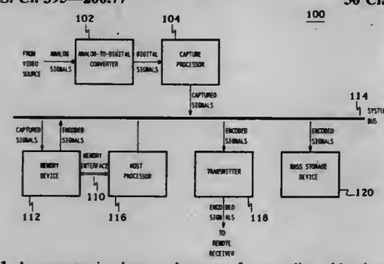
ADAPTIVE BLOCK CLASSIFICATION SCHEME FOR ENCODING VIDEO IMAGES

Vaughn Iverson, Beaverton, and Thomas R. Gardos, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1995, Ser. No. 536,323

Int. Cl.[6] H04N *1/413*

U.S. Cl. 395—200.77 **30 Claims**



1. A computer-implemented process for encoding video images, comprising the steps of:

(a) selecting a first threshold value for a first block of image signals of a video sequence based upon an encoding parameter;

(b) generating a statistical measure for the first block;

(c) selecting an encoding scheme for the first block by comparing the statistical measure for the first block to the first threshold value;

(d) encoding the first block based on the encoding scheme selected for the first block;

(e) selecting a second threshold value for a second block of image signals of the video sequence based upon said encoding parameter;

(f) generating the statistical measure for the second block;

(g) selecting an encoding scheme for the second block by comparing the statistical measure for the second block to the second threshold value; and

(h) encoding the second block based on the encoding scheme selected for the second block.

5,815,671

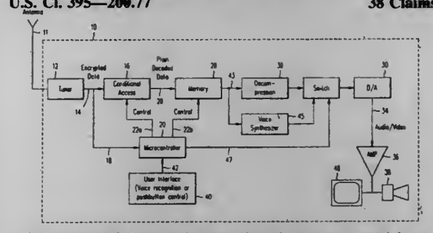
METHOD AND APPARATUS FOR ENCODING AND STORING AUDIO/VIDEO INFORMATION FOR SUBSEQUENT PREDETERMINED RETRIEVAL

Eric Fraser Morrison, Redwood City, Calif., assignor to Command Audio Corporation, Sunnyvale, Calif.

Filed Jun. 11, 1996, Ser. No. 664,290

Int. Cl.[6] H04N *1/41*

U.S. Cl. 395—200.77 **38 Claims**



1. Apparatus for presenting preselected program materials and message materials for transmission and retrieval by a user, comprising:

means for encoding the program materials and the message materials with signals identifying the respective materials and identifying when message material is to be inserted relative to program material;

a receiver for receiving and storing the encoded materials in real time; and

the receiver including means for subsequently retrieving the stored preselected program and message materials while determining which stored preselected message materials to insert relative to the program materials in response to a respective signal.

5,815,672

APPARATUS FOR EXCHANGING INFORMATION BETWEEN INTEGRATED CIRCUIT IDENTIFICATION CARDS AND A TERMINAL DEVICE

Alberto Dall' Asta, Pavia, Italy, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Jul. 26, 1996, Ser. No. 686,665

Claims priority, application Italy, Jul. 28, 1995, MI95A1664

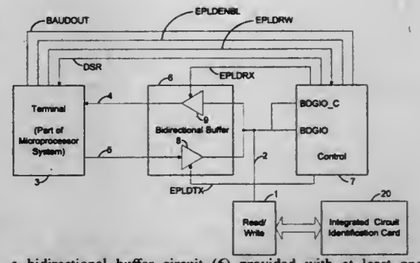
Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—282 **7 Claims**

1. An apparatus for exchanging information between integrated circuit identification cards and a terminal device (3) forming part of a microprocessor system, said apparatus including:

a read/write device (1) for said cards, which transmits and receives signals through a bidirectional serial line (2),

said terminal device (3) being connected to said read/write device (1) through said bidirectional serial line (2),



a bidirectional buffer circuit (6) provided with at least one enable command, said buffer circuit (6) disposed between said read/write device (1) and said terminal device (3), and

a control device (7) connected with said bidirectional serial line (2) for outputting a plurality of control commands towards said read/write device (1), said bidirectional buffer circuits (6) and said terminal device (3), so as to control an information exchange between the card read/write device (1) and the terminal device (3) so that the microprocessor system handles fast events independently of the read/write device (1) handling the card read/write operations, said fast events being capable of being handled faster than the card read/write operations.

5,815,673

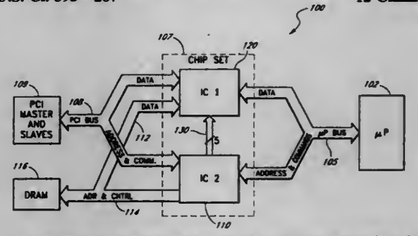
METHOD AND APPARATUS FOR REDUCING LATENCY TIME ON AN INTERFACE BY OVERLAPPING TRANSMITTED PACKETS

L. Randall Mote, Jr., Laguna Hills, Calif., assignor to Samsung Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 1, 1996, Ser. No. 609,175

Int. Cl.[6] H01J *13/00*

U.S. Cl. 395—287 **12 Claims**



1. A method of reducing a number of clock cycles required for communication of information packets on an interchip communication bus, said interchip communication bus being connected between a transmitting chip and a receiving chip, said method comprising the steps of:

outputting a first information word from said transmitting chip on said interchip bus in a first time interval;

registering said first information word within said transmitting chip in said first time interval, so that said first information word is available at said transmission chip during a second consecutive time interval;

receiving said first information word at said receiving chip in said first time interval;

registering said first information word at said receiving chip in said first time interval, so that said first information word is available at said receiving chip during a second consecutive time interval;

generating a second information word within said transmitting chip within said second time interval;

comparing said registered first information word with said second information word within said transmitting chip during said second time interval; and

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if said registered first information word is the same as said second information word, outputting a third information word over said interchip bus in place of said second information word during said second time interval, and

if said registered first information word is different from said second information word, transmitting said third information word in a third time interval immediately following transmission of said second information word in said second time interval.

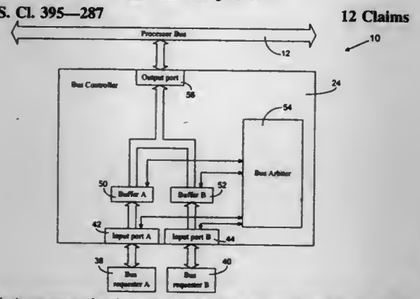
5,815,674

METHOD AND SYSTEM FOR INTERFACING A PLURALITY OF BUS REQUESTERS WITH A COMPUTER BUS

Paul A. LaBerge, Shoreview, Minn., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Jul. 15, 1996, Ser. No. 680,443
Int. Cl.[6] H01J *13/00*

U.S. Cl. 395—287 **12 Claims**



4. A computer-implemented method of interfacing a plurality of bus requesters with a computer bus, the method comprising:

receiving at a bus controller a first bus request from a first one of the plurality of bus requesters;

storing the first bus request in the bus controller;

receiving at the bus controller a first bus request from a second one of the plurality of bus requesters,

storing the first bus request from the second one of the plurality of bus requesters in the bus controller simultaneously with the storage of the first request from the first one of the plurality of bus requesters;

transmitting to the first one of the plurality of bus requesters an indication that the first bus request received from the first one of the plurality of bus requesters is stored in the bus controller, the indication enabling the first one of the plurality of bus requesters to prepare a second bus request;

after storing the first bus request from the first one of the plurality of bus requesters, selecting the first bus request from the first one of the plurality of bus requester for transmission on the computer bus;

preparing and transmitting the second bus request from the first one of the plurality of bus requesters while the first bus request is stored in the bus controller;

receiving the second bus request from the first one of the plurality of bus requesters wherein the selecting step includes arbitrating between the first bus requests and the second bus request; and

wherein the arbitrating step includes selecting for transmission on the computer bus the first and second bus requests from the first one of the plurality of bus requesters before selecting the first bus request from the second one of the plurality of bus requesters.

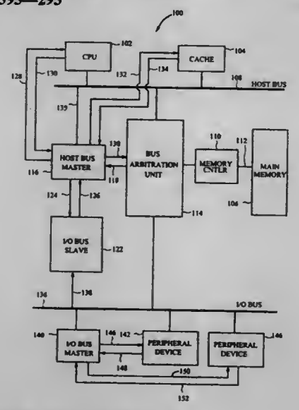
5,815,675

METHOD AND APPARATUS FOR DIRECT ACCESS TO MAIN MEMORY BY AN I/O BUS

James C. Steele, Chandler; Barry Davis; Philip Wszolek, both of Phoenix; Brian Fall, Chandler; Swaroop Adusumilli; David Cassetti, both of Tempe; Rodney Pesavento, Chandler, and Nick Richardson, Tempe, all of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 13, 1996, Ser. No. 670,273
Int. Cl.[6] G06F *13/16*

U.S. Cl. 395—293 **17 Claims**



1. A computer system comprising:

a processor for executing instructions of a computer program;

a main memory for storing data at addresses within said main memory;

a cache memory for storing a plurality of cache lines, each of the cache lines being associated with an address in said main memory;

a host bus for providing a first data transmission path;

an I/O bus for providing a second data transmission path;

a bus arbitration unit, operatively connectable to said main memory, said host bus and said I/O bus, for providing a reconfigurable third data transmission path between said host bus and said main memory and/or between said main memory and said I/O bus and/or between said I/O bus and said host bus, said reconfigurable third data transmission path being established between a first steering circuit and a second steering circuit, the first steering circuit being coupled to the second steering circuit via an internal bus that also connects to said main memory;

a host bus manager, operatively connected to said bus arbitration unit and said host bus, for controlling said bus arbitration unit to reconfigure the third data transmission path so that data requests from a device coupled to said I/O bus are fulfilled using the second and third data transmission paths while the first transmission path is available for use by said processor; and wherein said host bus manager issues a cache snoop to said cache memory using the first transmission path and

an I/O bus manager operatively connected to the I/O bus and said host bus manager to detect a data request from the device and forward the data request to said host bus manager,

wherein, in the case of a snoop miss, said bus arbitration unit decouples from said host bus immediately after the cache snoop because the first transmission path is not used in fulfilling the data request, thereby freeing said host bus for use by said processor while the data request is being fulfilled.

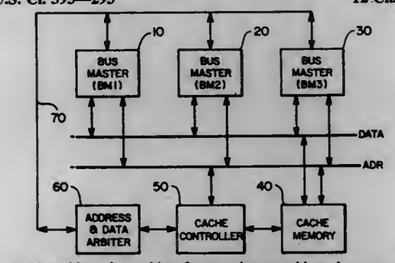
5,815,676

ADDRESS BUS ARBITER FOR PIPELINED TRANSACTIONS ON A SPLIT BUS

Farid A. Yazdy, Belmont, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 430,452, Apr. 28, 1995, abandoned. This application May 20, 1997, Ser. No. 859,392
Int. Cl.[6] G06F *13/362*

U.S. Cl. 395—293 **12 Claims**



11. An address bus arbiter for granting an address bus to one of a plurality of bus masters at a time comprising:

a state machine having a bus grant state associated with a bus grant for each of said plurality of bus masters, wherein one of said plurality of bus masters generates address-only cycles and wherein said state machine transitions to said bus grant state associated with said one of said plurality of bus masters when a data tenure of a previous address and data cycle is pending,

wherein said state machine also has at least one idle state during which all of said plurality of bus masters are prevented from acquiring said address bus;

wherein one of said at least one idle states is inserted between each of said bus grant states;

further wherein said idle states are reached from one of said bus grant states when one of said plurality of bus masters begins a transaction with another of said bus masters acting as a slave.

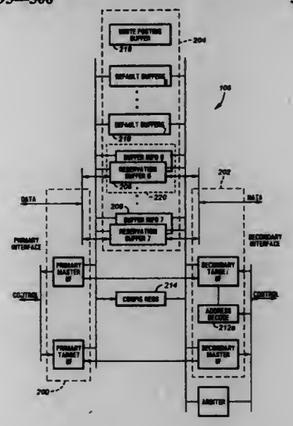
5,815,677

BUFFER RESERVATION METHOD FOR A BUS BRIDGE SYSTEM

Alan L. Goodrum, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Dec. 31, 1996, Ser. No. 774,746
Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—306 **36 Claims**



18. A method of reserving a buffer in a bus bridge, the method comprising the steps of:

(a) providing a frame indication;

(b) providing a reservation command when said frame indication is provided; and

(c) providing a bus command after step (b) and while said frame indication is provided.

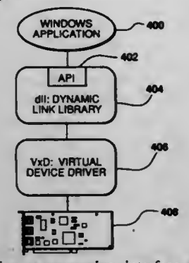
5,815,678

METHOD AND APPARATUS FOR IMPLEMENTING AN APPLICATION PROGRAMMING INTERFACE FOR A COMMUNICATIONS BUS

Gary Alan Hoffman; Eric Thomas Shalkey; Daniel Joseph Moore, all of Austin; Oscar Reid Mitchell, Pflugerville, and Rajat Datta, Round Rock, all of Tex., assignors to Adaptec, Inc., Milpitas, Calif.

Filed Jul. 14, 1995, Ser. No. 503,078
Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—309 **14 Claims**



1. An application programming interface for interfacing an application program to a 1394 communications bus comprising:

means for initializing and configuring the 1394 bus;

means, responsive to the application program, for allocating space in a storage means associated with the application program to receive or transmit data from or to the 1394 bus;

means for controlling transmission and reception of data on the 1394 bus; and

means for resetting and reconfiguring the 1394 bus when a change in device attachment occurs, wherein said means for resetting and reconfiguring includes one or more API commands callable by the application program.

5,815,679

INTERFACE DEVICE FOR CONTROLLING COMPUTER PERIPHERALS

Johny Liu, Taipei, Taiwan, assignor to Primax Electronics, Ltd., Taipei Hsien, Taiwan

Filed Jul. 23, 1996, Ser. No. 681,536
Int. Cl.[6] H01J *13/00*

U.S. Cl. 395—309 **5 Claims**

1. An interface device adapted to control computer peripherals connected to a computer, said computer including an operating system capable of running multiple software programs, including drivers for said computer peripherals, and providing a graphical user interface for permitting a user to interface with currently running programs, comprising:

(1) a housing;

(2) a micro-processor located in said housing and including means for generating control signals corresponding to said computer peripherals and transmitting said control signals to said computer in order to directly execute drivers for said computer peripherals without interrupting said currently running programs;

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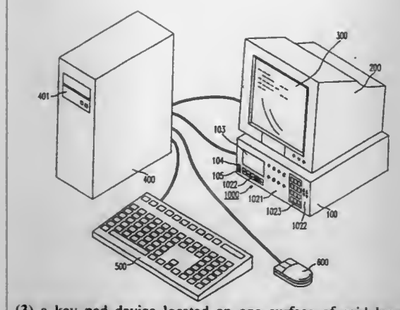


(3) a key pad device located on one surface of said housing including plural buttons for selecting which of said corresponding computer peripherals is to be controlled by said interface device.

5,815,680

SIMD MULTIPROCESSOR WITH AN INTERCONNECTION NETWORK TO ALLOW A DATAPATH ELEMENT TO ACCESS LOCAL MEMORIES

Yukihiko Okumura; Toshio Miki, both of Yokohama; Tomoyuki Ohya, Yokosuka, and Yoshinori Miki, Yokohama, all of Japan, assignors to NTT Mobile Communications Network, Inc., Japan

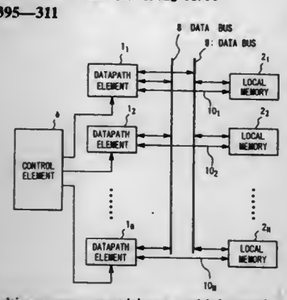
PCT No. PCT/JP94/01479, § 371 Date Oct. 25, 1995, § 102(e) Date Oct. 25, 1995, PCT Pub. No. WO93/09399, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 7, 1994, Ser. No. 356,275

Claims priority, application Japan, Sep. 27, 1993, 5-240083; Sep. 27, 1993, 5-240084

Int. Cl.[6] H01J *13/00*

U.S. Cl. 395—311 **10 Claims**



5. A multiprocessor comprising a multiple number of datapath elements and a multiple number of local memories, the number of the local memories being equal to or greater than the number of the datapath elements, each datapath element executing a same instruction, the multiprocessor characterized by that;

each of the multiple datapath elements and the local memories has a first input/output portion and a second input/output portion;

the multiprocessor comprising:

a first data bus connected with all of the first input/output portions of the multiple number of datapath elements, so that data can be exchanged between one of the multiple datapath elements and another datapath element through the first data bus;

a second data bus independent from the first data bus, the second data bus being connected with one of the multiple number of datapath elements and all of the first input/output portions of the local memories, so that data can be exchanged between one of the datapath elements and all of the local memories through the second data bus; and

a plurality of data paths directly connected with second input/output portions of the multiple number of datapath elements and the corresponding second input/output portions of the local memories, respectively, so that the datapath elements can respectively access to the corresponding local memories via the data paths in a parallel operating mode.

5,815,681

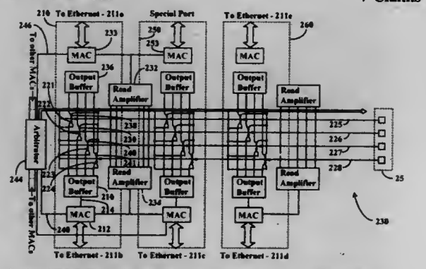
INTEGRATED NETWORK SWITCHING HUB AND BUS STRUCTURE

Dan Kikinis, Saratoga, Calif., assignor to Elonex PLC Ltd., United Kingdom

Filed May 21, 1996, Ser. No. 651,118

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—311 **7 Claims**



1. An integrated circuit (IC) switching hub, comprising:

a parallel bus of n bus lines implemented as traces on the IC;

a first data port adapter controller connected by n first port lines through a first output buffer to the bus, each first port line connected to a bus line source-to-drain through one of a set of first queue switch transistors, and connected to a first data port providing a first external data link for the switching hub;

a first read amplifier connected by n first receiver lines one each directly to each one of the n bus lines, and by a first data link to the first port adapter controller;

a second data port adapter controller connected by n second port lines through a second output buffer to the bus, each second port line connected to a bus line source-to-drain through one of a set of second queue switch transistors, and connected to a second data port providing a second external data link for the switching hub;

a second read amplifier connected by n second receiver lines one each directly to each one of the n bus lines and by a second data link to the second port adapter controller; and

an arbitrator controller connected by a first control line to the gates of the first set of queue switch transistors, by a second control line to the gates of the second set of queue switch transistors, by a third control line to the first port adapter controller, and by a fourth control line to the second port adapter controller;

wherein the arbitrator controller is adapted to switch data from the first and second port adapter controllers onto the bus through the first and second output buffers and the first and second sets of queue switch transistors by switching the gates of the transistors via the first and second control lines respectively, and adapted to transfer data from the bus to the first and second external data links via the first and second read amplifiers through the first and second port adapter controllers by enabling the respective port adapter controllers via the third and fourth control lines respectively, according to a preprogrammed arbitration scheme.

5,815,682

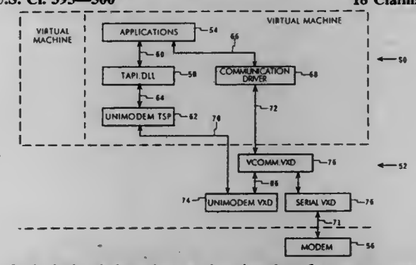
DEVICE INDEPENDENT MODEM INTERFACE

Robert J. Williams, Kirkland; Christopher P. Caputo, and Keith A. Laepple, both of Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 13, 1994, Ser. No. 356,059

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—500 **18 Claims**



1. A device independent modem interface for one or more application programs executing in a computer, the interface comprising:

a registry data store for storing modem specific control information;

a call controller for receiving modem independent call control commands from the application programs to control a modem;

a communication driver for receiving modem independent data I/O commands from the application programs to transfer data through the modem; and

a universal modem driver in communication with the registry data store for reading modem specific control information for the modem, the universal modem driver in communication with the call controller for receiving modem independent call control commands and in communication with the communication driver for receiving modem independent data I/O commands, the universal modem driver in communication with the modem for translating the modem independent call control commands to modem specific control commands based on the modem specific control information in the registry data store.

5,815,683

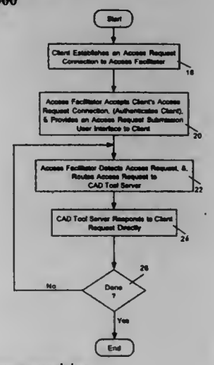
ACCESSING A REMOTE CAD TOOL SERVER

Joe E. Vogler, Salem, Oreg., assignor to Mentor Graphics Corporation, Wilsonville, Oreg.

Filed Nov. 5, 1996, Ser. No. 740,968

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—500 **17 Claims**



8. An apparatus comprising

(a) a storage medium having stored therein a plurality of programming instructions which, when executed by the apparatus, are operative to implement an access service facilitating remote access to computer-aided design (CAD) tools, the access service including services for accepting an access connection from a client, obtaining an internetworking address of the client, receiving an access request from the client for a CAD tool, and routing the access request along with the internetworking address of the client to the CAD tool, wherein the CAD tool responds directly to the client bypassing the access service; and

(b) an execution unit coupled to the storage medium for executing the plurality of programming instructions.

5,815,684

CONFIGURATION SIMULATING METHOD EMPLOYING STRING MODEL FOR SIMULATING LAYER CONFIGURATION OF SILICON WAFER

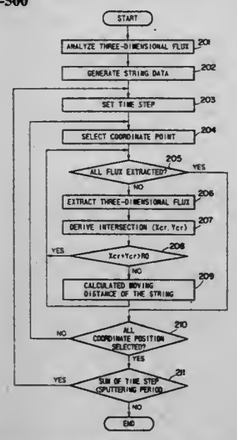
Toshiyuki Ohta; Hiroaki Yamada, and Toshiki Shinmura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 13, 1995, Ser. No. 527,452

Claims priority, application Japan, Dec. 20, 1994, 6-317147

Int. Cl.[6] G06F *17/18*

U.S. Cl. 395—500 **15 Claims**



1. A configuration simulating method for a layer deposited on a silicon wafer comprising the steps of:

(a) generating a string of modeling data, obtained by connecting coordinate points on a contour of a section, wherein the section is obtained by cutting a plane perpendicular to an open surface of a cylindrical contact hole, for modeling a configuration of said cylindrical contact hole formed within said silicon wafer;

(b) extracting flux vectors, flowing into a predetermined one of said coordinate points on the string of modeling data, by analyzing a flux vector of particles to be deposited on said silicon wafer, wherein said particles are present in a gas phase;

(c) judging whether said flux vector becomes null due to a shadow effect related to said cylindrical contact hole; and

(d) moving from said predetermined one of said coordinate points to another of said coordinate points corresponding to the projection of said flux vector on the plane, when said flux vector is judged as not becoming null.

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5,815,685

APPARATUS AND METHOD FOR CORRECTING LIGHT PROXIMITY EFFECTS BY PREDICTING MASK PERFORMANCE

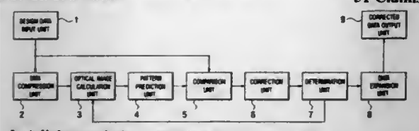
Kazuya Kamon, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1995, Ser. No. 529,177

Claims priority, application Japan, Sep. 16, 1994, 6-221956; Feb. 28, 1995, 7-040255; Aug. 10, 1995, 7-204837

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **51 Claims**



1. A light proximity correction system comprising:

a design data input unit for receiving design data of a circuit pattern;

a data compression unit for compressing the design data received via said design data received unit;

an optical image formation unit for forming an optical projection image used to transfer a pattern onto a wafer according to the design data input via said design data input unit;

a prediction unit for predicting the size of the pattern which will be transferred onto the wafer, the prediction being performed on the basis of the projection image formed by said optical image formation unit;

a comparison unit for calculating the difference between the size of the transfer pattern predicted by said prediction unit and the size of the pattern designated by the design data input via said design data input unit;

a correction unit for correcting the design data compressed by said data compression unit by an amount equal to the difference determined by said comparison unit;

a data expansion unit for expanding the data corrected by said correction unit; and

a corrected data output unit for outputting the data expanded by said data expansion unit.

5,815,686

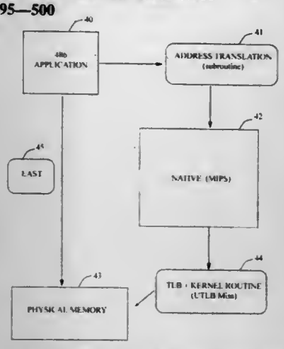
METHOD AND APPARATUS FOR ADDRESS SPACE TRANSLATION USING A TLB

William J. Earl, Boulder Creek, Calif., and Wayne Stuart Mesard, Belmont, Mass., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Sep. 12, 1996, Ser. No. 712,889

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **21 Claims**



1. In a computer system having a microprocessor with a translation look aside buffer circuit (TLB), a computer implemented method for translating addresses of an emulated virtual address space into addresses of a physical address space, the method comprising the computer implemented steps of:

(a) receiving a virtual address;

(b) comparing the virtual address with entries of the TLB;

(c) returning a physical address from the TLB when there is a match in an entry of the TLB with the virtual address;

(d) provided there is not a match in step (c), determining whether the virtual address is an emulated virtual address or a native virtual address by checking an address space identifier included in the virtual address;

(e) provided virtual address is an emulated virtual address, translating the virtual address to a corresponding physical address;

(f) storing into an entry of the TLB, the emulated virtual address and the corresponding physical address.

5,815,687

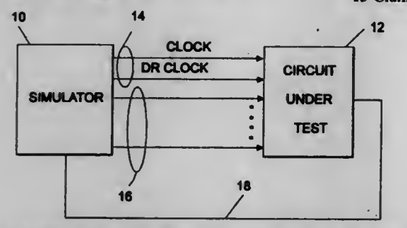
APPARATUS AND METHOD FOR SIMULATING DOMINO LOGIC CIRCUITS USING A SPECIAL MACHINE CYCLE TO VALIDATE PRE-CHARGE

Robert Masleid; Wolfgang Roesner, and Amy May Tuvell, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1996, Ser. No. 715,729

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **15 Claims**



1. A domino logic simulator for functional verification or simulation of multistage domino circuits comprising:

a) a precharge and logic circuit in each stage of the multistage domino logic circuit subject to a three stage simulation environment comprising a logic one (1) state; a logic zero (0) state and a logic "X" or don't care state which may be a logic 1 or logic 0 state;

b) means for supplying a sequence of test patterns to the multistage domino logic circuit for functional logic test purposes without testing the pre-charge circuit in each simulator cycle; and

c) means for validating the pre-charge circuit output for the domino logic circuit in a special machine cycle in a logic "X" state regardless of the signal inputs to each stage of the multistage domino circuit.

5,815,688

VERIFICATION OF ACCESSES IN A FUNCTIONAL MODEL OF A SPECULATIVE OUT-OF-ORDER COMPUTER SYSTEM

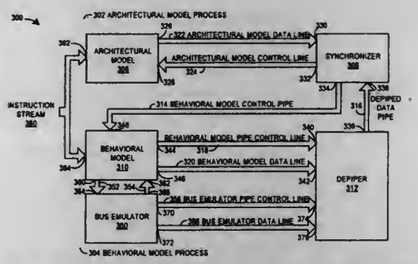
Gregory S. Averill, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 9, 1996, Ser. No. 728,088

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—500 **12 Claims**

1. A computer-based test system for verifying cache access handling in a computer architecture under test, said computer architecture under test comprising a data cache and supporting speculative and or out-of-order instruction execution, said test system comprising:



an architectural model which models high-level architectural requirements of said computer architecture and generates correct results under all received instruction test stimuli;

a behavioral model which models said high-level architectural requirements of said computer architecture and executes said received instruction test stimuli according to speculative and or out-of-order instruction execution behavior defined by said computer architecture;

a synchronizer which controls the execution of said architectural model and said behavioral model, matches all out of order instruction execution effects, and synchronizes said architectural model cache with said behavioral model cache by:

(i) receiving a behavioral model cache access event, said behavioral model cache access event affecting behavioral model cache data;

(ii) verifying that said behavioral model cache access event is legal according to architectural rules of speculative and or out-of-order instruction execution; and

(iii) if legal, applying said behavioral model cache access event to said architectural model cache.

5,815,689

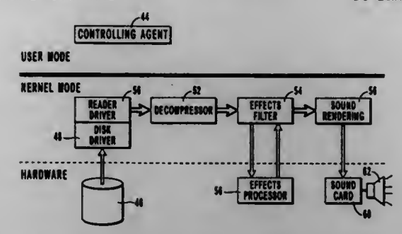
METHOD AND COMPUTER PROGRAM PRODUCT FOR SYNCHRONIZING THE PROCESSING OF MULTIPLE DATA STREAMS AND MATCHING DISPARATE PROCESSING RATES USING A STANDARDIZED CLOCK MECHANISM

George H. J. Shaw, Woodinville; Bryan A. Woodruff, New Bend, both of Wash., and Thomas J. O'Rourke, Oulu, Finland, assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 4, 1997, Ser. No. 826,560

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—551 **36 Claims**



1. A method for interconnecting software drivers to allow efficient kernel mode processing of data and having a standardized way of providing timing information for synchronizing different data streams or rate matching different hardware clocks, the method comprising the steps of:

opening one or more kernel mode drivers;

forming one or more connection pin instances for connecting the drivers, each connection pin instance hierarchically related to one of said one or more drivers and used for data transmission between said one or more drivers;

creating one or more clock mechanisms for rate matching and stream synchronization, each clock hierarchically related to one of said one or more connection pin instances and providing a data stream time and a physical time based on an underlying hardware oscillator; and

interconnecting said one or more connection pin instances so as to provide a continuous data flow path through the one or more drivers residing in kernel mode, said clocks making timing information available for rate matching between different clock oscillations and for synchronizing different data streams.

5,815,690

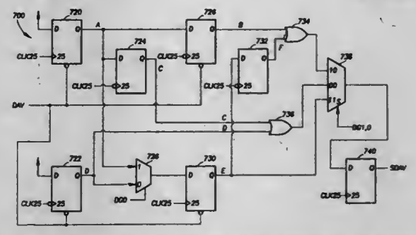
DEGLITCH METHOD AND APPARATUS TO ASSURE VALID DATA SAMPLING

Robert C. Kowert, Pflugerville, and Andrew Thomson, Austin, both of Tex., assignors to National Instruments Corporation, Austin, Tex.

Continuation of Ser. No. 472,967, Jun. 7, 1995, abandoned. This application Aug. 22, 1997, Ser. No. 916,500

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—552 **20 Claims**



1. A deglitch circuit for filtering false transitions of an input signal based on transitions of a clock signal, comprising:

a first memory device for detecting the input signal being asserted upon a first rising edge of the clock signal and for indicating subsequent duration of said input signal remaining asserted;

a second memory device coupled to said first memory device for detecting the input signal remaining asserted at least until the following falling edge after said first rising edge of the clock signal;

a third memory device for detecting the input signal being asserted upon a first falling edge of the clock signal and for indicating subsequent duration of said input signal remaining asserted;

a fourth memory device coupled to said first memory device for detecting the input signal remaining asserted at least until the following falling edge after said first rising edge of the clock signal and for indicating subsequent duration of the input signal remaining asserted;

a fifth memory device coupled to said third memory device for detecting the input signal remaining asserted at least until the following rising edge after said first falling edge of said clock signal and for indicating subsequent duration of the input signal remaining asserted;

a sixth memory device coupled to said fifth memory device for detecting the input signal asserted at least until the next falling edge after said first falling edge of said clock signal; and

a programmable memory device having at least two programmable states, a first state for coupling the said programmable memory device to said second and third memory devices for detecting the input signal remaining asserted for at least two consecutive clock transitions, and a second state for coupling said programmable memory device to said fourth and sixth memory devices for detecting the input signal remaining asserted for at least three consecutive clock transitions.

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5,815,691

METHOD FOR CONTROLLING AN EXTERNAL MEMORY FOR A CD-ROM DECODER AND APPARATUS THEREFOR

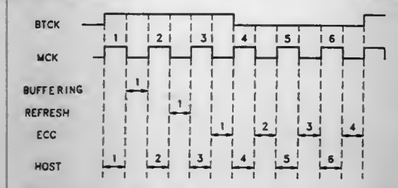
Sung-byun Chung, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 774,494

Claims priority, application Rep. of Korea, Apr. 10, 1996, 1996 10784

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—555 **8 Claims**



1. A method for controlling an external memory for a compact disk read-only-memory (CD-ROM) decoder which transmits CD-ROM data picked-up from a disk to a host under control of a CD-ROM controlling microcomputer, in which one-byte of data is transmitted during one period of a byte clock, and which has a master clock portions of which are allocated for different functions in synchronization with the period of the byte clock, the method for controlling the external memory comprises:

outputting the byte clock upon an occurrence of a predetermined number of periods of the master clock, wherein the byte clock and the master clock each have first and second levels;

allotting a portion of a first period of the master clock having the first level for performing a buffering operation;

allotting a portion of a second period of the master clock having the first level for performing one of a refresh cycle operation, a subcode storage operation, and data read and write operations of the CD-ROM controlling microcomputer with respect to the external memory;

allotting a portion of third through said predetermined number of periods of the master clock having the first level for performing an error correction operation; and

allotting a portion of said first through said predetermined number of periods of said master clock having the second level for transmitting the picked-up CD-ROM data to the host, whereby said external memory is accessed.

5,815,692

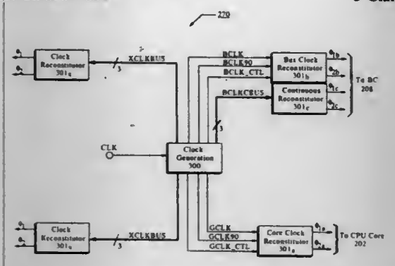
DISTRIBUTED CLOCK GENERATOR

Mark W. McDermott, Austin, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 15, 1995, Ser. No. 572,947

Int. Cl.[6] G06F *1/06*

U.S. Cl. 395—556 **5 Claims**



1. In a processing system comprised of a plurality of functional units, a distributed clock generator having independently adjustable clock signals for use by the plurality of functional units, the distributed clock generator comprising:

(a) a centrally disposed generator that generates two clock signals of equal frequency but substantially 90 degrees out of phase with one another and a control signal for each of a plurality of clock buses, each of the plurality of clock buses being independently controllable with respect to one another; and,

(b) a plurality of reconstitutors disposed substantially equidistant from the centrally disposed generator, each reconstitutor being coupled to at least one of the plurality of clock buses and generating a clock signal in response to the two clock signals and control signal on the at least one clock bus.

5,815,693

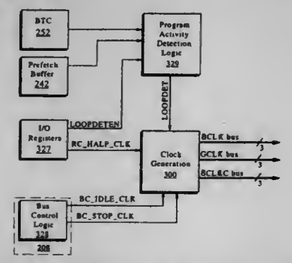
PROCESSOR HAVING A FREQUENCY MODULATED CORE CLOCK BASED ON THE CRITICALITY OF PROGRAM ACTIVITY

Mark W. McDermott, Austin, Tex., and Antone L. Fourcroy, Fort Collins, Colo., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 15, 1995, Ser. No. 572,994

Int. Cl.[6] G06F *1/04;1/08*

U.S. Cl. 395—556 **5 Claims**



1. A processor with a CPU core having a frequency modulated clock input based on criticality of program activity comprising:

(a) clock generation circuitry having at least one control input and at least one variable frequency clock output; and,

(b) control circuitry, coupled to the at least one control input, to ratchet the frequency of the at least one variable frequency clock output up and down responsive to indicia of whether the CPU core has been operating in a repetitive program loop.

5,815,694

APPARATUS AND METHOD TO CHANGE A PROCESSOR CLOCK FREQUENCY

Paul Allen Ganfield; Charles Luther Johnson, and James David Strom, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1995, Ser. No. 576,172

Int. Cl.[6] G06F *1/08*

U.S. Cl. 395—556 **17 Claims**

1. An apparatus for changing frequency of a clock signal provided to a processing unit, the apparatus comprising:

an input frequency clock source outputting an input frequency clock signal;

a frequency conversion circuit, coupled between the input frequency clock source and the processing unit, to produce an output clock signal having a frequency which is a multiple of the input frequency clock signal, as the clock signal provided to the processing unit wherein the frequency conversion circuit comprises:

a first divider circuit, coupled to receive the input frequency clock signal and to a control unit to receive a first division control signal, the first divider circuit dividing the input frequency clock signal by a first division factor N to produce a first divided signal in response to the first division control signal;

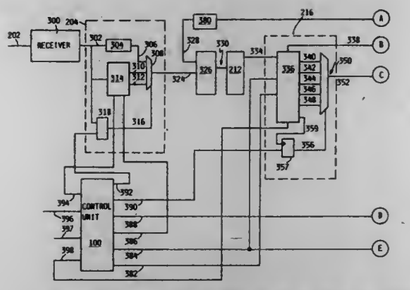
a phase/frequency comparator, coupled to receive the first divided signal as a first input;

a voltage controlled oscillator (VCO) coupled to receive a VCO control signal from the phase/frequency comparator, the VCO producing an output signal having a VCO frequency;

a second divider circuit, coupled to receive the output signal from the VCO and to the control unit to receive a second division control signal, the second divider circuit dividing the VCO frequency of the output signal by a second division factor A to produce a second divided signal as the clock signal provided to the processing unit in response to the second division control signal; and

a third divider circuit, coupled to receive the second divided signal and to the control unit to receive a third division control signal, the third divider dividing the second divided signal by a third division factor B to produce a third divided signal in response to the third division control signal, the third divider circuit being further coupled to the phase/frequency comparator to provide the third divided signal as a second input to the phase/frequency comparator, the phase/frequency comparator comparing frequency and phase of the first input and the second input to produce the VCO control signal; and

said control unit, coupled to the frequency conversion circuit, the control unit controlling a change in the frequency of the output clock signal such that a phase of the clock signal provided to the processing unit remains substantially constant.



5,815,695

METHOD AND APPARATUS FOR USING CONDITION CODES TO NULLIFY INSTRUCTIONS BASED ON RESULTS OF PREVIOUSLY-EXECUTED INSTRUCTIONS ON A COMPUTER PROCESSOR

David V. James, Palo Alto, and Mario D. Nemirovsky, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

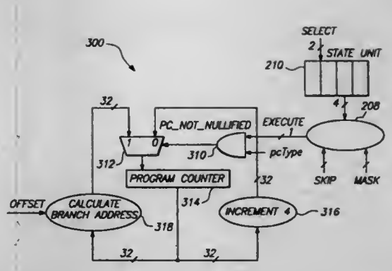
Continuation of Ser. No. 144,925, Oct. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 479,228

Int. Cl.[6] G06F *9/30*

U.S. Cl. 395—561 **27 Claims**

1. A method for conditionally nullifying a current instruction on a computer system having a processor capable of interpreting and executing an instruction and a state unit, the state unit having one or more state indicators, said one or more state indicators including a first and second state indicators, said first state indicator capable of specifying a first test value and said second state indicator capable of specifying a second test value, said method comprising the steps of:

setting said first state indicator to a first test value during execution of an instruction, said instruction being executed prior to execution of a current instruction; and



while processing a current instruction,

determining whether to nullify said current instruction based on said first test value of said first state indicator,

nullifying said current instruction based on the outcome of the determination, and

if said current instruction is not nullified and said current instruction specifies setting of a second test value, setting a second test indicator by specifying an arbitrary condition field in a condition register within said current instruction.

5,815,696

PIPELINE PROCESSOR INCLUDING INTERRUPT CONTROL SYSTEM FOR ACCURATELY PERFORM INTERRUPT PROCESSING EVEN APPLIED TO VLIW AND DELAY BRANCH INSTRUCTION IN DELAY SLOT

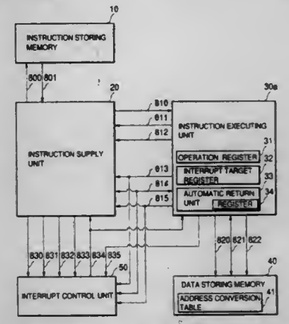
Kazuhiko Tanaka, Fujisawa; Tobru Nojiri, Tokyo-to; Keiji Kojima, Sagamihara; Kiyokazu Nishioka, Odawara, and Yoshiki Kurokawa, Sakai-gun, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1997, Ser. No. 888,789

Claims priority, application Japan, Jul. 8, 1996, 8-177773

Int. Cl.[6] G06F *9/38;9/30*

U.S. Cl. 395—580 **14 Claims**



1. A pipeline type processor for successively reading out and executing plural instructions, said plural instruction containing a branch instruction and being stored in a length-variable mode in a memory, including:

an instruction supply unit for successively reading out an instruction from the memory, and when the read-out instruction is the branch instruction, reading out an instruction at a branch target address indicated by the branch instruction after reading out a subsequent instruction contained in a delay slot of the branch instruction;

an instruction executing unit for executing the instruction read out by said instruction supply unit, and when the read-out instruction is the branch instruction, notifying the branch target address indicated by the branch instruction to said instruction supply unit; and

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an interrupt control unit for controlling, when an interrupt occurs, an instruction to be executed after returning from processing of the interrupt,

wherein said interrupt control unit has a register for storing, when the interrupt occurs, addresses of instructions from an interrupted instruction until an instruction to be executed following the interrupted instruction and then following the number of instructions corresponding to the number of the instructions contained in the delay slot and successively reads out the addresses stored in said register from the address of the interrupted instruction after the processing of the interrupt is completed, and

said instruction supply unit reads out the instruction of an address which is first read out from said register by the interrupt control unit and, with respect to each of the addresses of the second and subsequent instructions read out from said register by said interrupt control unit, branches, when the address is an address of an instruction indicated by the branch instruction, to the address to execute the instruction, and reads out, when the address is an address of an instruction other than the instruction indicated by the branch instruction, an instruction subsequent to the instruction being executed.

5,815,697

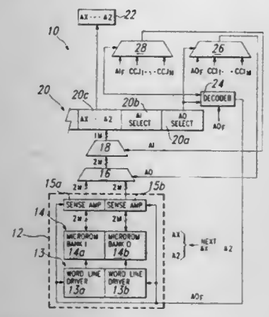
CIRCUITS, SYSTEMS, AND METHODS FOR REDUCING MICROPROGRAM MEMORY POWER FOR MULTIWAY BRANCHING

Patrick W. Bosshart, and Jonathan H. Shiell, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 9, 1997, Ser. No. 781,570

Int. Cl.[6] G06F *9/28;* **G11C** *7/00*

U.S. Cl. 395—583 **16 Claims**



1. A processor, comprising:

a microprogram memory comprising at least a first bank and a second bank, wherein each of the first and second banks is operable to concurrently output a plurality of microinstructions;

circuitry for forming a microaddress for addressing the microprogram memory, said circuitry for forming comprising:

circuitry for determining a value of a first bit from among a set including a plurality of condition values and at least one fixed value designated by a current microinstruction, wherein said fixed value is known before the condition values; and

circuitry for identifying a value of a second bit, wherein the microaddress comprises the first bit, the second bit, and a plurality of main bits;

circuitry responsive to the current microinstruction for determining whether the value of the first bit comprises the fixed value designated by the current microinstruction; and

responsive circuitry responsive to said circuitry for determining that the value of the first bit comprises the fixed value, wherein said responsive circuitry comprises:

circuitry for selectively energizing the first bank or the second bank in response to the value of the first bit;

circuitry for outputting the plurality of microinstructions from the energized bank; and

circuitry for selecting one of the plurality of output microinstructions in response to the value of the second bit.

5,815,698

MICROPROCESSOR HAVING DELAYED INSTRUCTIONS

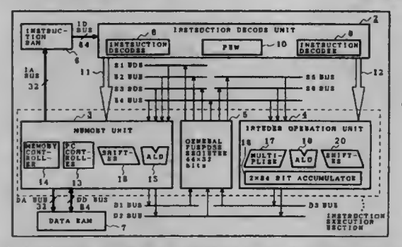
Edgar Holmann, and Toyohiko Yoshida, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1997, Ser. No. 788,839

Claims priority, application Japan, Aug. 1, 1996, 8-203675

Int. Cl.[6] G06F *9/34*

U.S. Cl. 395—584 **12 Claims**



1. A microprocessor having delayed instructions comprising:

an instruction decoder for decoding instructions including said delayed instructions; and

an instruction execution section for executing said instructions according to output transferred from said instruction decoder,

wherein said instruction execution section comprises an operation unit, said operation unit comprises delayed instruction storing means for storing operation information specified by delayed operation instruction as said delayed instructions and for storing a value indicating an execution start of operation of said delayed operation instruction.

5,815,699

CONFIGURABLE BRANCH PREDICTION FOR A PROCESSOR PERFORMING SPECULATIVE EXECUTION

David L. Puziol, Sunnyvale; Korbin S. Van Dyke, Fremont; Larry Widigen, Salinas; Len Shar, Menlo Park, and Walstein Bennett Smith, III, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Austin, Tex.

Continuation of Ser. No. 112,572, Aug. 25, 1993, Pat. No. 5,454,117. This application Jun. 6, 1995, Ser. No. 472,698

Int. Cl.[6] G06F *9/00*

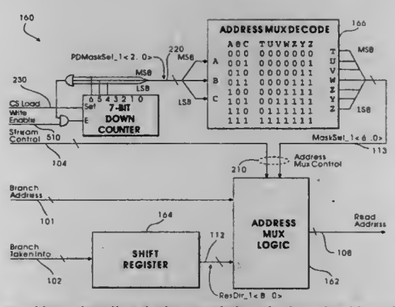
U.S. Cl. 395—586 **39 Claims**

11. A digital processor, comprising:

a shift register storing a branch taken status bit indicative of whether a recent branch was taken, wherein the shift register provides the branch taken status bit to a branch taken status output line;

a branch address line carrying a branch address bit;

a random access memory comprising a plurality of addressable entries, an entry storing a value representative of a state of a branch history state machine; and



an address decoding device coupled to the branch address line and the branch taken status output line to selectively address the random access memory based on the branch taken status bit in a first mode, and to selectively address the random access memory based on the branch address bit in a second mode.

5,815,700

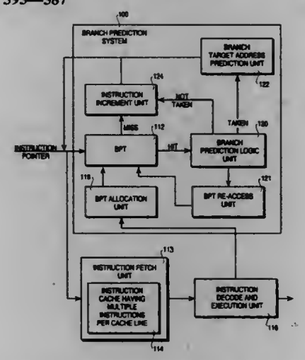
BRANCH PREDICTION TABLE HAVING POINTERS IDENTIFYING OTHER BRANCHES WITHIN COMMON INSTRUCTION CACHE LINES

Mircea Poplingher, Campbell; Tse-Yu Yeh, Milpitas, and Wenliang Chen, Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 22, 1995, Ser. No. 576,954

Int. Cl.[6] G06F *9/32*

U.S. Cl. 395—587 **18 Claims**



10. A method for performing sequential branch predictions in consecutive clock cycles, comprising the steps of:

performing a branch prediction table (BPT) access for a first branch instruction of a cache line in a first clock cycle;

determining whether the first branch instruction is the only branch instruction of the cache line; and

if the first branch instruction is not the only branch instruction of the cache line, performing a next BPT access for a next sequential branch instruction of the cache line in a clock cycle immediately following the first clock cycle.

5,815,701

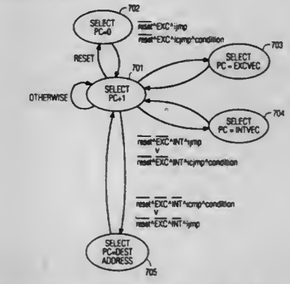
COMPUTER METHOD AND APPARATUS WHICH MAINTAINS CONTEXT SWITCHING SPEED WITH A LARGE NUMBER OF REGISTERS AND WHICH IMPROVES INTERRUPT PROCESSING TIME

Gerrit Ary Slavenburg, Los Altos, Calif., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Jun. 29, 1995, Ser. No. 496,630

Int. Cl.[6] G06F *9/42*

U.S. Cl. 395—591 **28 Claims**



1. Method for processing an interrupt or an exception in a computer processor, the method comprising the steps of

a. distinguishing a successful interruptable jump operation, in an instruction stream; and

b. transferring processor control from the instruction stream to an interrupt or exception handler only in response to such a successful interruptable jump operation.

5,815,702

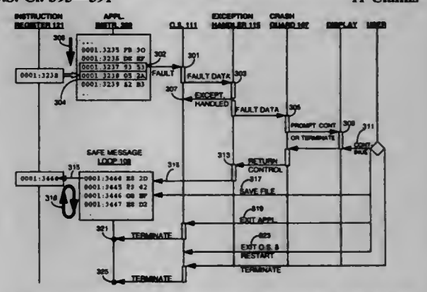
METHOD AND SOFTWARE PRODUCTS FOR CONTINUED APPLICATION EXECUTION AFTER GENERATION OF FATAL EXCEPTIONS

Ravi Kannan; Babu Katchapalayam, both of 11826 Kiowa Ave. #101, Los Angeles, Calif. 90049, and Bing Liu, 1016 S. Second St., Alhambra, Calif. 91801

Filed Jul. 24, 1996, Ser. No. 686,250

Int. Cl.[6] G06F *9/46*

U.S. Cl. 395—591 **11 Claims**



1. In a computer system including a processor, an operating system and at least one application executable by the processor, a computer readable medium storing a software product comprising:

an exception handler that controls the processor to receive a notification from the operating system that an exception has been generated by an application;

a background executable program that is invoked by the exception handler, that notifies the operating system that the exception has been handled; and,

a set of instructions provided to the processor by the exception handler, for execution by the processor in a continuous loop, and that receive from the operating system messages for the

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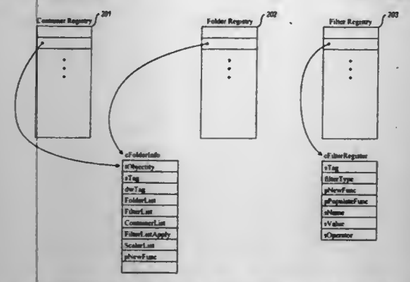
application and provide the messages to the application for handling, enabling the application to continue execution by the processor after the exception has been generated.

5,815,703

COMPUTER-BASED UNIFORM DATA INTERFACE (UDI) METHOD AND SYSTEM USING AN APPLICATION PROGRAMMING INTERFACE API

Bruce W. Copeland, Redmond, and Jonathan I. Shuval, Bellevue, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 28, 1996, Ser. No. 672,451
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—613 **36 Claims**



1. A computer-based uniform data interface (UDI) system for accessing in a uniform manner data from a data source with an arbitrary organization, comprising:

a uniform data interface (UDI) API having a plurality of UDI API functions for creating and accessing data organized into containers, each container having one or more folders, each folder optionally containing sub-folders and scalars;

a UDI registry for registering types of containers and folders supported by a data source, for enumerating the types of containers and folders supported by the data source, and for instantiating container and folder objects corresponding to the data of the data source; and

a UDI mapper for registering with the UDI registry types of containers and folders that represents the data of the data source, for instantiating in memory container and folder objects of the registered types, and for populating an instantiated container object with folders representing the data from the data source that is within the container

whereby when an application program invokes the UDI API functions to access data of data sources with arbitrary organizations.

5,815,704

DOCUMENT FILING APPARATUS AND METHOD HAVING DOCUMENT REGISTRATION, COMPARISON AND RETRIEVAL CAPABILITIES

Shigeyoshi Shimotsuji; Hiroaki Kubota; Mieko Asano, and Osamu Hori, all of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

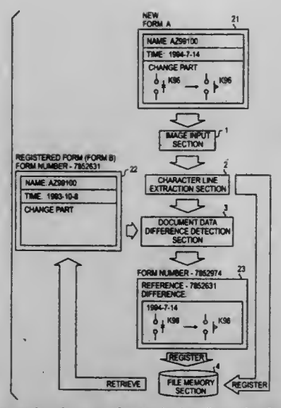
Filed Jan. 26, 1996, Ser. No. 592,706
Claims priority, application Japan, Feb. 22, 1995, 7-034002
Int. Cl.[6] G06F *17/21*
U.S. Cl. 395—615 **17 Claims**

1. Document filing apparatus comprising:

file means for storing a plurality of documents having line data, character data and image data;

image input means for inputting image data of a new document;

character-line extraction means for extracting line data and character data from the input image data;



document retrieval means for retrieving from the file means one of the stored documents to be compared with the new document, the one of stored documents being similar to the new document;

difference detection means for detecting

differences of line data, character data, and image data between the new document and the retrieved document, said differences called difference data; and

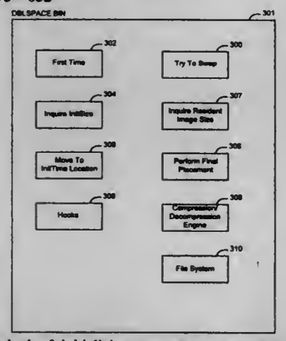
register means for registering the difference data and identification information of the retrieved document as the new document in said file means or for registering line data, character data and image data of the new document in said file means, if there is no stored document that compares to the new document.

5,815,705

METHOD AND COMPUTER SYSTEM FOR INTEGRATING A COMPRESSION SYSTEM WITH AN OPERATING SYSTEM

Benjamin W. Slivka, Clyde Hill; Charles A. Strouss, III, Redmond, and Scott D. Quinn, Issaquah, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 140,753, Oct. 21, 1993. This application May 25, 1995, Ser. No. 450,374
Int. Cl.[6] G06F *9/06*
U.S. Cl. 395—652 **17 Claims**



1. A method of initializing a computer system to include a compression system, the computer system having a fixed volume and a removable volume, the method comprising the steps of:

determining whether the removable volume is a boot volume from which to boot the computer system; and

when the removable volume is the boot volume, loading the compression system from the removable volume; and

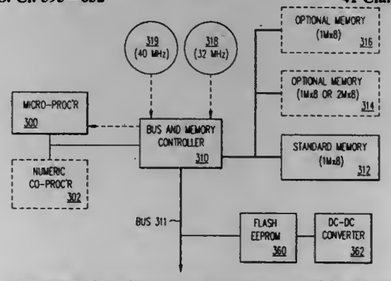
executing an initialization function of the loaded compression system wherein when configuration information for the compression system resides on the removable volume, the compression system is initialized in accordance to configuration information of the removable volume, and when the configuration information for the compression system does not reside on the removable volume, the compression system is initialized in accordance to configuration information that resides on the fixed volume.

5,815,706

COMPUTER SYSTEM WITH PLUG-IN OVERRIDE OF SYSTEM ROM

Gregory N. Stewart; Anthony Lynn Overfield, both of Austin, and Mark T. Ellis, Cedar Park, all of Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Continuation of Ser. No. 197,110, Feb. 16, 1994, Pat. No. 5,471,674, which is a continuation of Ser. No. 831,218, Feb. 7, 1992, abandoned. This application Sep. 20, 1995, Ser. No. 530,918
Int. Cl.[6] G06F *9/445*
U.S. Cl. 395—652 **41 Claims**



1. A method of booting a computer system comprising the steps of:

coupling a boot card having a boot program to the computer, the boot card capable of communicating with a central processing unit (CPU) within the computer, the computer having a boot memory and a disabling circuit;

providing a disabling signal from the boot card to the computer;

receiving the disabling signal in the computer;

disabling the computer boot memory with the disabling circuit;

reading the boot card boot program;

writing the boot card boot program into the computer boot memory to replace a boot program stored in the computer boot memory;

resetting the CPU to cause the CPU to boot; and

retrieving and executing, with the CPU, the boot program written into the computer boot memory from the boot card.

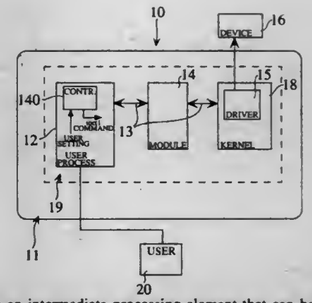
5,815,707

DYNAMIC FUNCTION REPLACEMENT FOR STREAMS FRAMEWORK

Michael R. Krause, Boulder Creek, and Yoshihiro Ishijima, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 19, 1995, Ser. No. 545,561
Int. Cl.[6] G06F *9/40*
U.S. Cl. 395—681 **29 Claims**

1. A data structure implemented in a computer system that provides a bidirectional data path between a user process, a module



which is an intermediate processing element that can be dynamically added to, or removed from, said data path, and a device driver, said device driver being resident in a system kernel and controlling a peripheral device to transfer data between said kernel and said device, where data written by said user process travel downstream toward said driver, and where data received by said driver from said device travel upstream to be retrieved by a user, the data structure comprising:

a normal function that implements a specific module or driver instance;

at least one alternative function that implements an optional module or driver instance; and

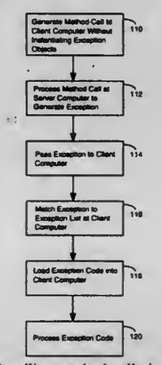
a controller for generating a control command that remaps addresses of said normal function and said at least one alternative function to define new function addresses that dynamically replace said normal function with said at least one alternative function, thereby implementing said optional module or driver or instance to dynamically change the execution behavior of said data structure, while either still executing an original execution path or executing a new execution path, and without requiring any modification to said module and said driver.

5,815,708

METHOD AND APPARATUS FOR DYNAMICALLY LOADING METHOD CALL EXCEPTION CODE IN RESPONSE TO A SOFTWARE METHOD EXCEPTION GENERATED IN A CLIENT/SERVER COMPUTER SYSTEM

Peter B. Kessler; Graham Hamilton, both of Palo Alto, and Jeffrey D. Nisewanger, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Oct. 6, 1995, Ser. No. 540,129
Int. Cl.[6] G06F *9/46*
U.S. Cl. 395—683 **12 Claims**



1. A method for handling method calls in a client/server computer system said method comprising the steps of:

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receiving at a server computer a method call generated by a client computer;

attempting to execute said method call on said server computer;

generating at said server computer an exception to said method call in response to said attempting step;

passing said exception to said client computer;

matching at said client computer said exception to exceptions in an exception list to obtain an exception object identifier, wherein said matching step includes the step of using an exception list with a plurality of subset lists, each of said subset list corresponding to a specified exception and including a set of entries corresponding to different protocol-dependent statements used to characterize said specified exception;

loading into said client computer exception code corresponding to said exception object identifier; and

processing said exception code to respond to said exception of said method call.

5,815,709

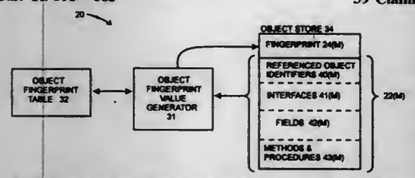
SYSTEM AND METHOD FOR GENERATING IDENTIFIERS FOR UNIQUELY IDENTIFYING OBJECT TYPES FOR OBJECTS USED IN PROCESSING OF OBJECT-ORIENTED PROGRAMS AND THE LIKE

James H. Waldo, Dracut, Mass.; Krishna Bharat, Atlanta, Ga., and Roger Riggs, Burlington, Mass., assignors to San Microsystems, Inc., Palo Alto, Calif.

Filed Apr. 23, 1996, Ser. No. 636,707

Int. Cl.[5] G06F *7/00*

U.S. Cl. 395—683 **39 Claims**



1. A fingerprint generating system for use generating a fingerprint value for an object in an object-oriented programming arrangement, the object comprising a digital information stream, the fingerprint generating system comprising:

A. a receiver for receiving the digital information stream comprising the object;

B. an object fingerprint value generator for processing the digital information stream in accordance with a selected hash value generating algorithm, the hash value generating algorithm being selected from a class of hash value generating algorithms characterized in that:

i. in response to said input digital information stream, a digital hash value having a predetermined number of digital bits will be generated as an output;

ii. the digital hash value will be a function of the digital information stream, so that

(a) given two input streams that are identical, identical digital hash values will be generated; but

(b) given two input streams that are not identical, it is extremely unlikely that identical digital hash values will be generated; and

iii. when the object, as a "referencing object," includes a reference to another object, as a referenced object, the object fingerprint value generator can process the input digital information stream of the referencing object including a referenced object fingerprint generated for the referenced object, rather than a digital information stream associated with the referenced object,

the digital output value generated according to the selected hash value generating algorithm comprising the fingerprint generated by said fingerprint generating system.

5,815,710

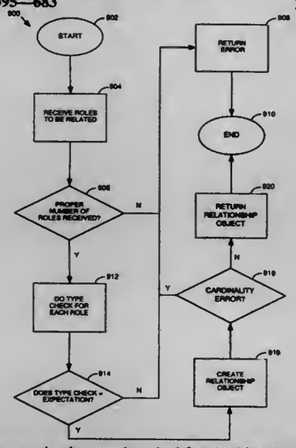
METHOD AND APPARATUS FOR MANAGING RELATIONSHIPS AMONG OBJECTS IN A DISTRIBUTED OBJECT ENVIRONMENT

Bruce E. Martin, Bisbane; Jefferson A. Dinkins, Sunnyvale, and Mark W. Hapner, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Division of Ser. No. 408,634, Mar. 22, 1995. This application Sep. 17, 1996, Ser. No. 718,062

Int. Cl.[6] G06F *9/40*

U.S. Cl. 395—683 **22 Claims**



1. A computer implemented method for checking the validity of a desired relationship to be created among two or more objects residing in one or more processes running under computer control on one or more computers interconnected on a network in a distributed object system, the method comprising the steps of:

passing under computer control a role from each object to be related to a relationship factory mechanism which is effective to create said desired relationship among said objects, the relationship factory mechanism including an expectation array of role types expected for said desired relationship;

creating under computer control a type check array by comparing each role passed to said relationship factory mechanism to the expectation array ; and

determining under computer control whether each role passed to said relationship factory mechanism is of the appropriate type for said desired relationship by analyzing said type check array.

5,815,711

APPARATUS AND METHOD FOR PROGRAM GENERATION

Kazuhiko Sakamoto, Kawasaki; Tetsuya Masuishi, Machida, and Takashi Okoda, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1995, Ser. No. 554,632

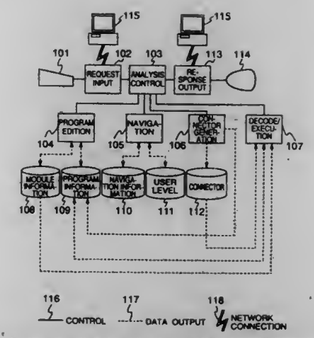
Claims priority, application Japan, Nov. 15, 1994, 6-280235

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—701 **20 Claims**

1. A method for generating a program by combining a set of program modules on an information processing system having a computer, a memory and input/output devices, comprising the steps of:

(a) visually displaying the set of program modules stored in the memory on a display device by a command inputted from the input device;



(b) retrieving navigation programs for defining different combinations of the set of program modules stored in the memory based on a command inputted from the input device;

(c) displaying the retrieved navigation programs on the display device;

(d) selecting a desired navigation program from the navigation program group displayed on the display device by a command inputted from the input device;

(e) executing the navigation program;

(f) designating guide parameters outputted by the navigation program for the combination of the set of program modules by commands inputted from the input device;

(g) generating a connector module for combining the set of program modules from the guide parameters; and

(h) storing the generated connector module in the memory.

5,815,712

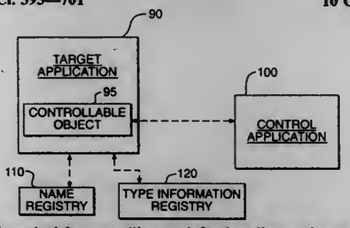
SYSTEM FOR CONTROLLING FUNCTIONS OF A TARGET APPLICATION USING CONTROLLABLE OBJECTS

David M. Bristor, Menlo Park; Brian T. Lewis, and Graham Hamilton, both of Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Continuation of Ser. No. 339,105, Nov. 14, 1994, abandoned. This application Jul. 18, 1997, Ser. No. 897,055

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—701 **10 Claims**



1. A method for controlling predefined attributes of an application stored in a memory and executed by a processor coupled to the memory, including the steps of:

(1) generating a controllable object by executing code in the application, the controllable object including at least one control having a control name and a control value and further including at least a first object function for getting said at least one control and a second object function for setting said at least one control; and

(2) executing a predefined control program separate from the application, including the steps of:

(2.1) establishing a communications link with the controllable object by interrogating a name registry to obtain an object reference and interrogating a type information registry, which lists objects of the application which are controllable, to obtain a type of the obtained object reference;

(2.2) invoking the first object function on the controllable object to retrieve a list including said at least one control;

(2.3) invoking the second object function on the controllable object based upon a user-determined input; and

(2.4) setting an internal state of the controllable object based upon said user-determined input.

5,815,713

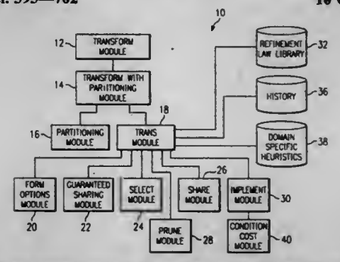
METHOD AND SYSTEM FOR AUTOMATED TRANSFORMATION OF DECLARATIVE LANGUAGE PROCESS SPECIFICATIONS

Paul Sanders, Surbiton, England, assignor to Sterling Software, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 421,337, Apr. 13, 1995, Pat. No. 5,758,032. This application Jun. 7, 1995, Ser. No. 473,691

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—702 **10 Claims**



1. An automated method of transforming a declarative language specification of a problem into a procedural language specification of said problem using a computer, said computer including a memory, comprising the steps of:

applying a plurality of refinement laws and domain specific heuristics to said declarative language specification to generate a plurality of procedural language implementations in accordance with a given optimization level;

determining a cost associated with each of said plurality of procedural language implementations; and

selecting a portion of said plurality of procedural language implementations to form said procedural language specification of said problem in accordance with said cost.

5,815,714

EMBEDDED DEBUG COMMANDS IN A SOURCE FILE

Avadhani Shridhar, Sunnyvale, and John Simons, Burlingame, both of Calif., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Continuation of Ser. No. 366,050, Dec. 29, 1994, abandoned. This application Apr. 21, 1997, Ser. No. 839,229

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—704 **6 Claims**

1. In a computer system, a method for automatically generating a debugger command file having debug commands for execution during source code simulation comprising the steps of:

(1) embedding at least one debug command in at least one line of a source program;

(2) assembling said source program, said assembling step including:

(a) extracting said embedded debug commands,

(b) generating a break-point command associated with each of said embedded debug commands,

(c) creating said command file by writing said break-point commands and associated debug commands into said command file, and

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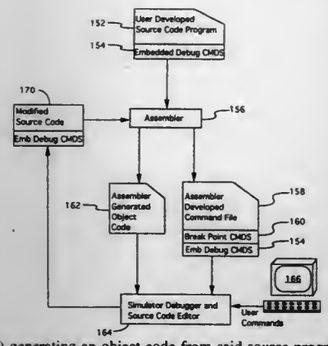


(d) generating an object code from said source program; and

(3) upon modification of said source program, removing said break point commands and associated embedded debug commands from said command file so that during re-assembly of said modified source program, a new command file is automatically created containing new break point commands associated with said embedded debug commands at their new respective locations in said source program.

5,815,715

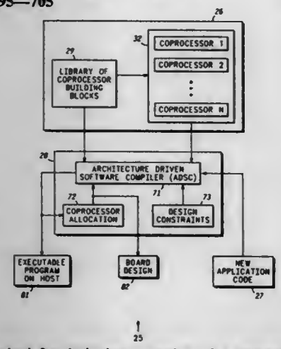
METHOD FOR DESIGNING A PRODUCT HAVING HARDWARE AND SOFTWARE COMPONENTS AND PRODUCT THEREFOR

Kayhan Küçükçakar, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1995, Ser. No. 463,228

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—705 **21 Claims**



8. A method for designing a portion of a computing system, comprising the steps of:

providing a host microprocessor;

providing a plurality of programmable coprocessors and a netlist representation for each programmable coprocessor of the plurality of programmable coprocessors, wherein each programmable coprocessor of the plurality of programmable coprocessors has a predetermined architectural style;

providing a plurality of building blocks for the plurality of programmable coprocessors and a description for each of the plurality of building blocks for the plurality of programmable coprocessors;

extracting the functionality of each programmable coprocessor from the netlist representation;

allocating a first set of programmable coprocessors from the plurality of programmable coprocessors;

providing a software application code;

compiling the software application code with the host microprocessor and the first set of programmable coprocessors; and

generating a first software program, wherein the first software program:

is executable on the host microprocessor;

programs at least one of the first set of programmable coprocessors;

executes a portion of the software application on the host microprocessor; and

dispatches a portion of the software application to at least one of the first set of programmable coprocessors.

5,815,716

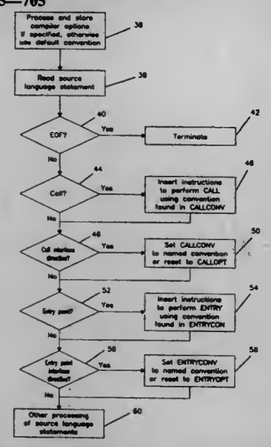
METHOD FOR SUPPORTING MULTIPLE CALL INTERFACE CONVENTIONS FOR COMPUTER PROGRAMS USING DIRECTIVES

Tsuneo Horiguchi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1995, Ser. No. 539,512

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—705 **27 Claims**



1. A method of programming a computer, comprising the steps of:

(a) receiving one or more programming language statements comprising a source program into a memory of the computer, wherein at least one of the received statements comprises a selection of a call interface convention for invoking procedures, wherein the selection of the call interface convention occurs at a run-time of the compiler, and the selection of the call interface convention remains in effect for a range of the received statements; and

(b) compiling the source program into an object program in the memory of the computer, wherein the object program includes instructions for performing separate procedure calls and entry points according to the selection of the call interface convention.

5,815,717

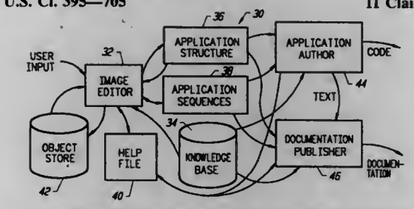
APPLICATION PROGRAM AND DOCUMENTATION GENERATOR SYSTEM AND METHOD

Brian T. Stack, Miami Lakes, Fla., assignor to Authorgenics, Inc., Miami Lakes, Fla.

Filed Oct. 27, 1995, Ser. No. 549,633

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—705 **11 Claims**



1. A programmed system executed on a computer providing for the automatic generation of an application program, said programmed system comprising:

a) a guided image editor for establishing program, data and field definitions from a plurality of input event elements;

b) a sequence generator, coupled to said guided image editor for autonomously processing said program, data and field definitions into a plurality of functionally descriptive atomic sequences, each of said functionally descriptive atomic sequences describing a unique characteristic such that a plurality of frames, each comprising zero or one functionally descriptive atomic sequence from each of said functionally descriptive atomic sequences, respectfully describes said plurality of input event elements; and

c) a rule processor including a program rule base conditionally describing the structure and operation of a predetermined application program, said rule processor autonomously processing said program rule base in concert with said plurality of functionally descriptive atomic sequences proceeding generally sequentially over said plurality of frames conditionally unifying said plurality of functionally descriptive atomic sequences with the structure and operation of said predetermined application program.

5,815,718

METHOD AND SYSTEM FOR LOADING CLASSES IN READ-ONLY MEMORY

Theron D. Tock, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed May 30, 1996, Ser. No. 655,474

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—705 **20 Claims**

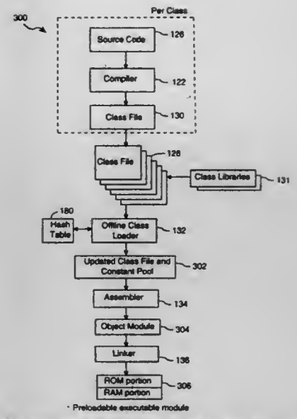
1. A method of operating a computer, the method comprising the steps of:

storing a class in a memory, the class including data and at least one method that includes a plurality of instructions, a subset of the instructions including symbolic references to computer accessible methods;

flagging portions of the class' data when the class' data is modifiable by one of the class' methods;

flagging each method of the class that includes a symbolic reference to a method not stored in the memory; and

providing an executable module including the class, wherein each unflagged method and each unflagged data is preloaded in a read-only storage medium and each flagged method and



each flagged data is to be stored in a read and write-enabled storage medium when executing the executable module.

5,815,719

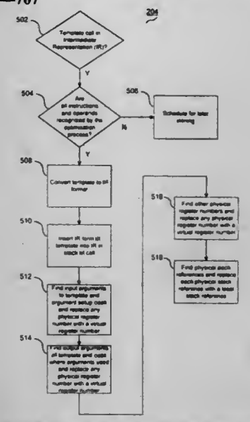
METHOD AND APPARATUS FOR EASY INSERTION OF ASSEMBLER CODE FOR OPTIMIZATION

Kurt J. Goebel, Mountain View, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed May 7, 1996, Ser. No. 643,895

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—707 **20 Claims**



1. A method of inserting an assembly code routine into a source code routine prior to optimization in a data processing system compiler, said method comprising the steps of:

providing an assembly code template having the instructions and operands of the assembly code routine;

providing a set of recognized instructions recognizable by the compiler for code optimization;

scanning the instructions and operands of the template to determine whether all instructions and operands of the template are included in the set of recognized instructions; if so,

virtualizing the template;

transforming the assembly code in the template into an intermediate form usable by the compiler;

transforming the source code into an intermediate form usable by the compiler; and

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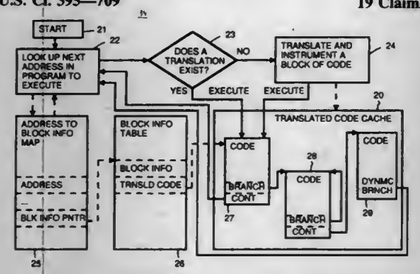
combining the intermediate form assembly code and the intermediate form source code.

5,815,720

USE OF DYNAMIC TRANSLATION TO COLLECT AND EXPLOIT RUN-TIME INFORMATION IN AN OPTIMIZING COMPILATION SYSTEM

William B. Buzbee, Half Moon Bay, Calif., assignor to Institute For the Development Of Emerging Architectures, L.L.C., Palo Alto, Calif.

Filed Mar. 15, 1996, Ser. No. 616,608
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—709 **19 Claims**



1. A method for producing optimized object code for a high level computer language pro ram comprising the steps of:

(a) compiling source code for the high level computer language program to produce first object code;

(b) generating profile information about the first object code, including the following steps

(b.1) dynamically translating the first object code to produce second object code, the second object code including profiling code which, when executed, produces the profile information,

(b.2) executing the second object code, including producing the profile information; and,

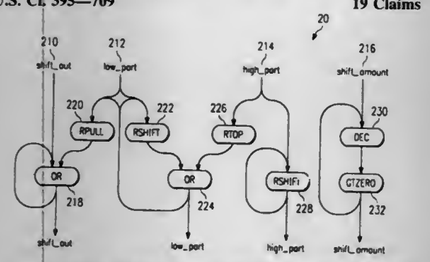
(c) recompiling the source code to produce the optimized object code, the recompiling including using the profile information in the production of the optimized object code.

5,815,721

METHOD AND APPARATUS FOR OPTIMIZING COMPLEX CONTROL STRUCTURES USING ABSTRACT WEB PATTERNS

Manuel E. Benitez, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 25, 1996, Ser. No. 637,988
Int. Cl.[6] G06F *9/45;9/44*
U.S. Cl. 395—709 **19 Claims**



7. An compiler adapted for execution on a computer system having a CPU and a memory, comprising:

means, executing on the CPU and stored in the memory, for converting a high-level computer program into low-level code comprised of at least one code segment;

means for scanning the low-level code and generating a first abstract representation of the code segment;

means for comparing the first abstract representation with at least one other abstract representation stored in the memory, wherein the compared at least one other abstract representation has an associated optimized code segment; and

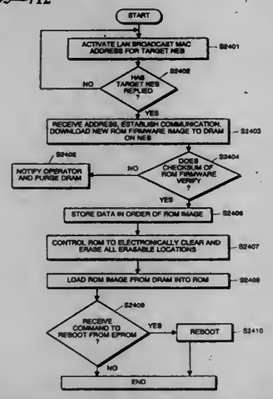
means for replacing the code segment with the optimized code segment corresponding to a matched one in the memory of the at least one other abstract representation.

5,815,722

IN AN INTERACTIVE NETWORK BOARD, A METHOD AND APPARATUS FOR REMOTELY DOWNLOADING AND EXECUTING FILES IN A MEMORY

George A. Kalwitz, Costa Mesa; William C. Russell, Laguna Hills; H. Brad Emerson, Costa Mesa, and Natsuko Takahashi, Long Beach, all of Calif., assignors to Canon Information Systems, Inc., Irvine, Calif.

Filed Nov. 18, 1992, Ser. No. 978,488
Int. Cl.[6] G06F *13/10*
U.S. Cl. 395—712 **29 Claims**



1. A method, for use in a local area network system comprising one or more network nodes and one or more interactive network boards each interfaced to the local area network by a local area network interface, for downloading an executable file from a remote network node to a designated interactive network board, the method comprising the steps of:

activating a LAN communication program at the remote network node, said LAN communication program operating to broadcast an inquiry from the remote network node through the local area network for the designated interactive network board, to receive location information of the designated interactive network board in response to the broadcast inquiry, and to establish communication with the designated interactive network board;

downloading the executable file, from the remote network node, over the LAN, into a RAM on the designated interactive network board, said executable file including a checksum packet;

verifying a checksum value of the executable file against a checksum value in the checksum packet using a processor on the interactive network board;

loading the executable file from the RAM into an EPROM on the interactive network board in a case that the processor has verified the checksum value successfully; and

receiving, in the interactive network board, at least one command from the LAN without putting the processor in an idle state;

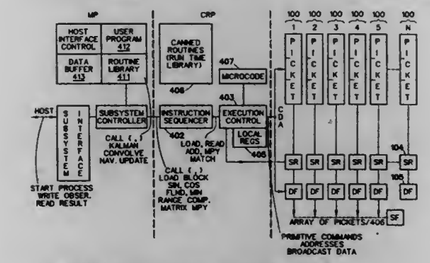
wherein in a case that the at least one command is a remote execute command, the processor reboots the interactive network board from the executable file in the EPROM.

5,815,723

PICKET AUTONOMY ON A SIMD MACHINE

Paul Amba Wilkinson, Apalachin; Thomas Norman Barker, Vestal; James Warren Dieffenderfer, Owego, and Peter Michael Kogge, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 480,931, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 887,256, May 22, 1992, which is a continuation-in-part of Ser. No. 611,594, Nov. 13, 1990, abandoned, and Ser. No. 798,788, Nov. 27, 1991, abandoned. This application Sep. 30, 1996, Ser. No. 723,375
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—800.2 **13 Claims**



1. A parallel array computer, comprising:

an array of processor memory elements interconnected for transfer of data and instructions between processor memory elements, each of said processor memory elements having a processor coupled with a dedicated local memory for processing independent data streams located one per processor memory element;

an array controller for controlling the operation of said array of processor memory elements by simultaneously applying a single instruction to the processor memory elements;

wherein status information for each of said processor memory elements is obtained by the array controller through a status funnel;

wherein each of said processor memory elements has a local autonomous operating mode in which each of the processor memory elements interprets the single instruction to execute a locally stored instruction which is independent of the single instruction and of instructions executed by other processor memory elements in response to the single instruction;

wherein each of said processor memory elements is adapted to interpret instructions from said array controller within the processor memory element to selectively invoke the local autonomous operating mode;

wherein some of said processor memory elements further include set associative memory;

wherein said array controller provides single-cycle transfer of data from a first processor memory element to a second non-adjacent processor memory element by turning off any intervening processor memory elements through the use of slide register latches; and

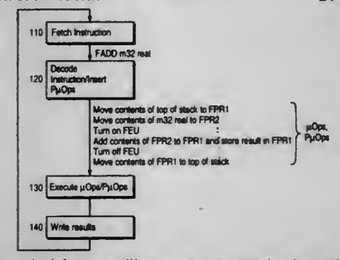
wherein said parallel array computer provides a multi-processor memory system including a PME architecture multi-processor memory element on a single semiconductor substrate which functions as a systems node, said multi-processor memory element including a plurality of processing memory elements, and means on said substrate for distributing interconnection and controls within the multi-processor memory system node enabling the system to perform SIMD/MIMD functions as a multi-processor memory system, wherein each said dedicated local memory is independently accessible by the respectively coupled processor in both SIMD and MIMD modes exclusive of access by another process.

5,815,724

METHOD AND APPARATUS FOR CONTROLLING POWER CONSUMPTION IN A MICROPROCESSOR

John William Benson Mates, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Mar. 29, 1996, Ser. No. 623,978
Int. Cl.[6] G96F *1/32*
U.S. Cl. 395—750.04 **24 Claims**



1. A method for controlling power consumption in a microprocessor, comprising the steps of:

fetching an instruction;

decoding the instruction to produce at least one operation, thereby creating an operation flow;

inserting at least one power micro-operation into the operation flow, the power micro-operation providing power consumption control for at least one functional unit required to execute the operation, the power micro-operation in addition to the operation provided by decoding the instruction;

scheduling the operation and power micro-operation for dispatch; and

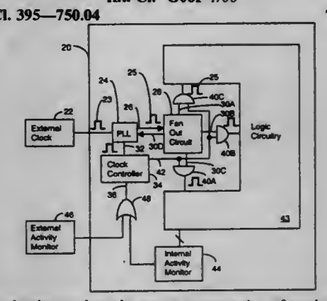
dispatching the operation and power micro-operation to appropriate execution units for execution.

5,815,725

APPARATUS AND METHOD FOR REDUCING POWER CONSUMPTION IN MICROPROCESSORS THROUGH SELECTIVE GATING OF CLOCK SIGNALS

Gary F. Feierbach, Belmont, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Apr. 3, 1996, Ser. No. 627,078
Int. Cl.[6] G06F *1/00*
U.S. Cl. 395—750.04 **7 Claims**



1. A circuit to reduce the power consumption of a microprocessor, comprising:

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a phase-locked loop circuit within said microprocessor to produce an internal clock signal from an externally generated clock signal;

activity monitor circuitry within said microprocessor to generate an activity signal in response to a low activity operational state of said microprocessor;

a clock controller within said microprocessor and connected to said phase-locked loop circuit and said activity monitor circuitry, said clock controller producing a periodic clock gating signal from said internal clock signal and said activity signal; and

clock gating circuits within said microprocessor and connected to said phase-locked loop circuit and said clock controller, said clock gating circuits periodically applying said internal clock signal to microprocessor logic circuitry in response to said periodic clock gating signal such that said microprocessor logic circuitry receives a periodically clocked microprocessor clock for ongoing computational operations with reduced power consumption.

5,815,726

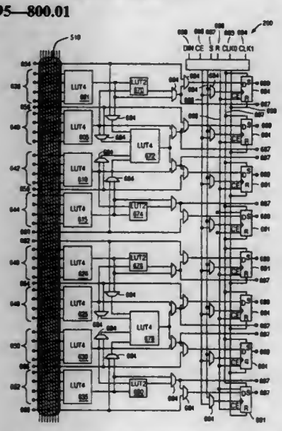
COARSE-GRAINED LOOK-UP TABLE ARCHITECTURE

Richard G. Cliff, Milpitas, Calif., assignor to Altera Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 334,879, Nov. 4, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 484,831

Int. Cl.[6] H03K *19/177*

U.S. Cl. 395—800.01 **32 Claims**



1. A logic array block for a programmable logic device comprising:

a first dedicated input;

a first four-input function block for implementing logic functions;

a second four-input function block for implementing logic functions;

a two-input function block for implementing logic functions, wherein an output of said first four-input function block is coupled to a first input of said two-input function block; and

a first multiplexer block, selectively coupling said first dedicated input and said output of said first four-input function block to a first input of said second four-input function block.

5,815,727

PARALLEL PROCESSOR FOR EXECUTING PLURAL THREAD PROGRAM IN PARALLEL USING VIRTUAL THREAD NUMBERS

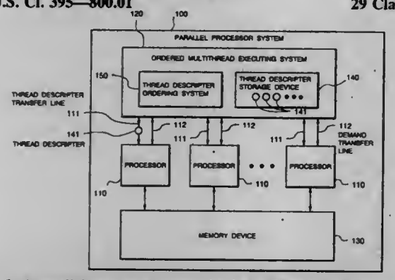
Masato Motomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1995, Ser. No. 575,860

Claims priority, application Japan, Dec. 20, 1994, 6-317162; Mar. 1, 1995, 7-041538

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—800.01 **29 Claims**



1. A parallel processor system having a Plurality of processors executing a program having a plurality of threads executable in parallel, comprising:

thread generating means for managing three thread states of: (1) an executing state, (2) an executable state and (3) a waiting state and generating other threads in the executable state by a fork operation from the threads in the executing state;

thread execution control means for executing a first thread in the executable state, executing a second thread in the executable state in place of said first thread when the first thread in the executing state enters into waiting state, and re-executing said first thread in the waiting state after termination of execution of said second thread;

said thread generating means generating virtual thread numbers on a sequential execution path, said virtual thread numbers defining an order of termination of threads in sequential execution of said program along the sequential execution path; and

said thread execution control means controlling execution of said threads so that synchronization operations in said program are performed only in the direction from the thread having a smaller virtual thread number to the thread having a greater virtual thread number.

5,815,728

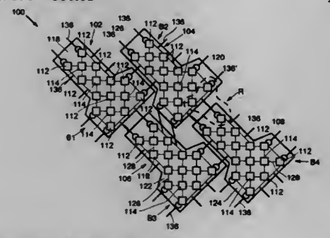
PROCESSOR ARRAY

Malcolm A. Mumme, Altadena, Calif., assignor to Raytheon Company, El Segundo, Calif.

Filed Mar. 1, 1996, Ser. No. 609,585

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800.01 **1 Claim**



1. A processor array comprising:

a semiconductor chip having first and second sets of processors arranged within the boundaries thereof wherein each of said processors within said first set (i) is positioned adjacent said chip boundary and (ii) includes first and second horizontal and first and second vertical communication ports, wherein the first and second horizontal communication ports of each of said processors within said second set are linked by a horizontal interconnection line to a horizontal port of one of said processors, and wherein the first and second vertical communication ports of each of said processors within said second set are connected by a vertical interconnection line to a vertical communication port of one of said processors, and further wherein each of said processors within said second set includes means for transferring information along said horizontal interconnection lines during said first clock cycle and along said vertical interconnection lines during said second clock cycle; and

means for providing a plurality of electrical paths across said chip boundary, including switch means for connecting each of said paths to a horizontal communication port of an associated one of said processors in said first set during a first clock cycle and for connecting each of said paths to a vertical communication port of said associated processor during a second clock cycle, so that the sets of porcessors transfer data horizontally and vertically in alternate clock cycles, and wherein said switch means includes a first set of switches for connecting each of said paths to the second horizontal communication port of said associated processor during said first clock cycle and a second set of switches for connecting each of said paths to the second vertical port of said associated processor during said second clock cycle;

wherein each of said electrical paths include N electrical I/O lines and wherein each of said interconnection paths include N interconnection lines, each of said I/O lines being connected to one of said switches in said first set of switches and to one of said switches in said second set of switches.

5,815,729

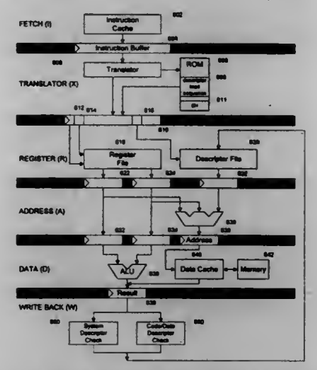
METHOD AND APPARATUS FOR ON THE FLY DESCRIPTOR VALIDATION

G. Glenn Henry, and Terry Parks, both of Austin, Tex., assignors to Integrated Device Technology, inc., Santa Clara, Calif.

Filed Aug. 18, 1997, Ser. No. 912,264

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—800.32 **21 Claims**



1. A microprocessor, for loading a descriptor directly from a memory into a descriptor register, without requiring that the descriptor be temporarily stored in an intermediate test location, the microprocessor comprising:

an instruction buffer, for temporarily holding a descriptor load instruction directing the microprocessor to load a descriptor;

a data stage, coupled to said instruction buffer, for addressing the memory, and for retrieving a descriptor from the memory as designated by the descriptor load instruction;

a code/data descriptor validation logic, coupled to said data stage, for viewing the descriptor retrieved from the memory, and for providing a valid/invalid output signal, depending on whether the descriptor is valid or invalid, on an output line; and

a descriptor register file, having a write/enable input coupled to said output line of said code/data descriptor validation logic, and coupled to said data stage, for receiving the descriptor retrieved by said data stage, and for writing the descriptor into a descriptor register within said descriptor register file when said code/data descriptor validation logic provides said valid output signal to said write/enable input.

5,815,730

METHOD AND SYSTEM FOR GENERATING MULTI-INDEX AUDIO DATA INCLUDING A HEADER INDICATING DATA QUANTITY, STARTING POSITION INFORMATION OF AN INDEX, AUDIO DATA, AND AT LEAST ONE INDEX

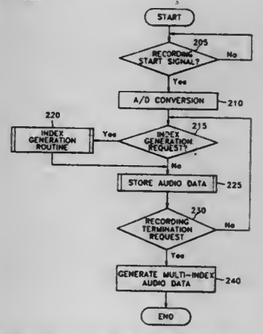
Han-sang Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jan. 18, 1996, Ser. No. 588,084

Claims priority, application Rep. of Korea, Jan. 19, 1995, 95-846

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—825 **11 Claims**



1. An audio data recording method comprising:

converting an audio signal into digital audio data;

determining the presence or absence of a request for index generation;

generating an index corresponding to the digital audio data in response to a request for index generation;

storing the digital audio data;

determining the presence or absence of a request for recording termination; and

generating multi-index audio data containing the digital audio data and the index in response to a request for recording termination, wherein generating the multi-index audio data includes generating a least a header portion, an audio data portion, and at least one index, wherein the header portion has header information and initial index starting position information, and wherein the index includes at least starting position information of the corresponding audio data and the following index, additional information, and position information for the additional information.

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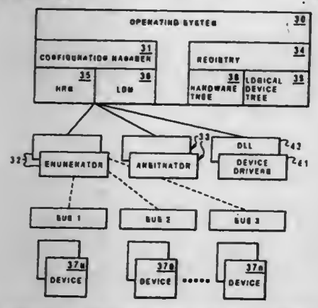
5,815,731

METHOD AND SYSTEM FOR PROVIDING DEVICE DRIVER CONFIGURATIONS ON DEMAND

Ronald Patrick Doyle, Raleigh; Patricia Stephany Hogan, Chapel Hill, both of N.C., and Sandra Juni Schlosser, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1996, Ser. No. 742,232
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—830 **6 Claims**



1. A method for providing device driver configurations on demand during runtime within a computer system, said method comprising the steps of:

constructing a Hardware Namespace by a Hardware Resource Manager within said computer system;

constructing a Logical Device Namespace by a Logical Device Manager within said computer system;

only in response to an attempt to access a peripheral device for the first time by an application software after system boot-up, determining whether or not said peripheral device is contained within said Hardware Namespace utilizing said Hardware Resource Manager, and determining whether or not a device driver for said peripheral device is also contained within said Logical Device Namespace utilizing said Logical Device Manager;

in response to a determination that said peripheral device is not contained within said Hardware Namespace, prompting a user to install said peripheral device within said computer system;

in response to a determination that said device driver for said peripheral device is not contained within said Logical Device Namespace, prompting said user to install said device driver for said peripheral device to said computer system; and

loading said device driver to a system memory such that said peripheral device can be utilized by said application software via said device driver.

5,815,732

SYSTEM FOR SERVICE ACTIVATION PROGRAMMING OF WIRELESS NETWORK ACCESS DEVICES USING AN EXTERNAL MODULE

Gershon N. Cooper, Encino, and Asher Avitan, Granada Hills, both of Calif., assignors to ORA Electronics, Inc., Chatsworth, Calif.

Filed Feb. 20, 1996, Ser. No. 603,465
Int. Cl.[6] G06F *13/14;* **H04Q** *7/32;7/34*
U.S. Cl. 395—856 **47 Claims**

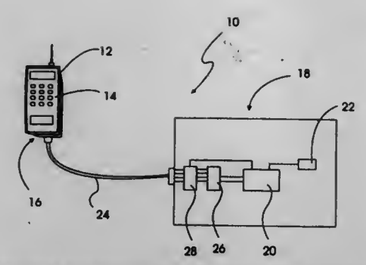
1. A system for service activation programming of a wireless network access device, the device having a keypad for manually entering data and commands to the device, and a device Input/Output data interface bus port for communicating data and command signals between an external source and the device databus, said system comprising:

module having processing means containing and operating in accord with a control program, said processing means further having in memory means, prestored data necessary for service activation programming of the wireless network access device to at least partially program the device for service activation;

means, detachably connecting said external module to the wireless network access device, for transferring information therebetween,

said control program transferring data from said external module to the device for service activation programming of the device; and,

means for delaying the programming operation of said control program for a preselected time period.

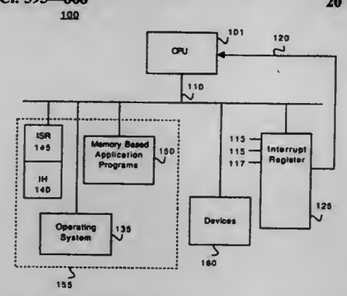


5,815,733

SYSTEM FOR HANDLING INTERRUPTS IN A COMPUTER SYSTEM USING ASIC RESET INPUT LINE COUPLED TO SET OF STATUS CIRCUITS FOR PRESETTING VALUES IN THE STATUS CIRCUITS

Eric C. Anderson, and Celeste Johnson, both of San Jose, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 1, 1996, Ser. No. 595,493
Int. Cl.[6] G06F *9/00;9/46*
U.S. Cl. 395—868 **20 Claims**



1. A circuit for facilitating communications between peripherals and a control device, comprising:

a first set of input circuits, at least one of the first set of input circuits being responsive to peripheral signals from a respective peripheral, including a signal pulse and a signal level change from a first level to a second level;

a set of status circuits coupled to the first set of input circuits, responsive to the peripheral signals being received at the first set of input circuits to generate a set of status signals;

a set of output circuits coupled to the set of status circuits, for indicating the set of status signals to the control device; and

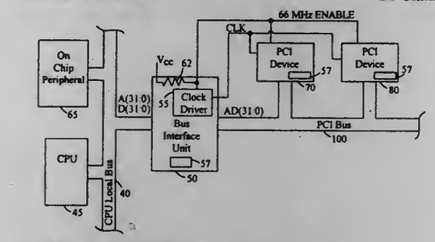
an ASIC reset input line coupled to the set of status circuits for presetting values in the status circuits.

5,815,734

SYSTEM AND METHOD FOR RECONFIGURING CONFIGURATION REGISTERS OF A PCI BUS DEVICE IN RESPONSE TO A CHANGE IN CLOCK SIGNAL FREQUENCY

Sherman Lee, Rancho Palos Verdes, Calif., and Michael T. Wisor, Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 308,151, Sep. 19, 1994, Pat. No. 5,678,065. This application Jun. 4, 1997, Ser. No. 868,797
Int. Cl.[6] G06F *13/00;13/38*
U.S. Cl. 395—880 **14 Claims**



1. A computer system, comprising:

a central processing unit connected to a local bus;

a peripheral bus;

a bus interface unit coupled to said local bus and to said peripheral bus for orchestrating the transfer of data and address signals between said local bus and said peripheral bus;

one or more peripheral bus devices coupled to said peripheral bus; and

a clock driver connected to said peripheral bus for driving a peripheral bus clock signal at a peripheral bus clock signal frequency based upon the capabilities of the peripheral bus, said bus interface unit and said one or more peripheral bus devices;

wherein said bus interface unit and said one or more peripheral bus devices each include a status register with a dedicated bit to indicate an ability to accommodate a high peripheral bus clock signal frequency; and

wherein each of said one or more peripheral bus devices includes a MIN_GNT register and a MAX_LAT register, wherein said MIN_GNT register specifies the length of time that said peripheral bus device requires to complete a peripheral bus transaction, wherein said MAX_LAT register specifies how often said peripheral bus device needs to gain access to said peripheral bus, and wherein the parameters of these registers are modified in anticipation of a change in the peripheral bus clock signal frequency.

5,815,735

PORTABLE COMPUTER WITH REMOVABLE DISPLAY SCREEN USING REMOVABLY MATEABLE CONNECTORS TO FORM THE SOLE SUPPORTING INTERCONNECTION BETWEEN THE COMPUTER BASE PORTION AND DISPLAY SCREEN STRUCTURE

Douglas E. Baker, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

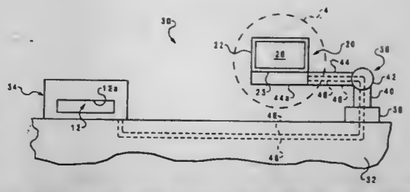
Filed Apr. 29, 1996, Ser. No. 639,784
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—892 **31 Claims**

1. An electronic device comprising:

a base portion having first electronic circuitry, a hinge structure carried thereon, and a keyboard section;

first connector means carried by said hinge structure for pivotal movement therewith relative to said base portion and coupled to said first electronic circuitry;

a display screen structure having second electronic circuitry; and



second connector means carried by said display screen structure and coupled to said second electronic circuitry, said second connector means being:

(1) removably mateable with said first connector means to removably attach said display screen structure to said base portion, for transport and direct use therewith and pivotal movement relative thereto on said hinge structure, and releasably couple said first and second electronic circuitry, the removably mated first and second connector means forming the sole supporting interconnection between said base portion and said display screen structure, and

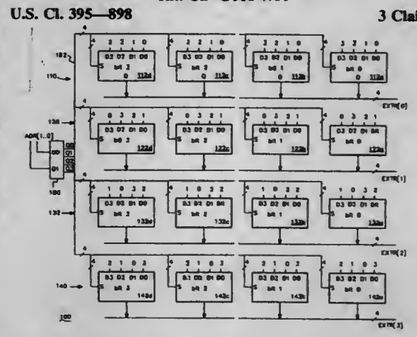
(2) removably mateable with a third connector structure, supported in a spaced apart relationship with said base portion and coupled to said first electronic circuitry, to couple said first and second electronic circuitry and permit said display screen structure to be used in a separated relationship with said base portion.

5,815,736

AREA AND TIME EFFICIENT EXTRACTION CIRCUIT

Christopher E. Phillips, San Jose, and Narendra Sankar, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1995, Ser. No. 451,434
Int. Cl.[6] G06F *7/00*
U.S. Cl. 395—898 **3 Claims**



1. A data word extraction circuit that receives a plurality (n) of data words DW_x (for x equal 0 through n−1), each of said data words DW_x having a plurality (m) of bit positions BP_y (for y=0 through m−1), and that provides one of said data words DW_x to an extraction circuit output responsive to an extraction indicator signal, said data element extraction circuit comprising:

a group of data selector elements DSE_y, each of said data selector elements corresponding to a separate one of the bit positions BP_y in the received data words and including

a data output DO_y;

a plurality of data inputs DI_x, each data input DI_x connected to receive a bit from the bit position BP_y to which the data selector element DSE_y corresponds, of a data word DW_x to which the data input DI_x corresponds; and

a select input responsive to the extraction indicator signal such that the data selector element DSE_y provides, at the

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data output, the bit received at one of the data inputs DI_x that corresponds to the extraction indicator signal,

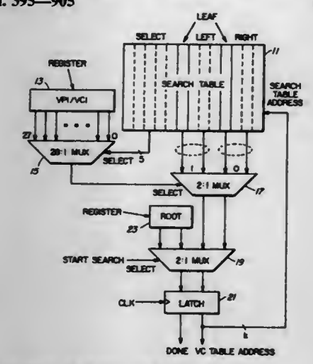
the bits provided at the data outputs of the group of data selector elements being collectively provided to the extraction circuit output.

5,815,737

APPROACH FOR IDENTIFYING A SUBSET OF ASYNCHRONOUS TRANSFER MODE (ATM) VPI/VCI VALUES IN THE COMPLETE VPI/VCI RANGE

Kenneth M. Buckland, Burnaby, Canada, assignor to PMC-Sierra, Inc., Burnaby, Canada

Filed Jun. 5, 1995, Ser. No. 461,450
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—905 **15 Claims**



1. A searching apparatus comprising:

(a) a memory storing a search table, the search table comprising records, each record comprising a select word, a left leaf field, a left address field, a right leaf field and a right address field,

(b) means for receiving an input word to be searched,

(c) means for selecting one bit of the input word based on a value in a select word of a first record,

(d) means for reading a left or right address field in said record, based on a binary value of said one bit,

(e) means for reading a left or right leaf field in said record based on said binary value of said one bit,

(f) means for selecting another record based on data stored in said left or right address field in the event of one particular binary value being stored in a corresponding left or right leaf field,

(g) means for providing the data stored in said left or right address field at an output port in the event of another particular binary value being stored in said corresponding left or right leaf field, as an address to another table for identifying a record corresponding to the input word.

5,815,738

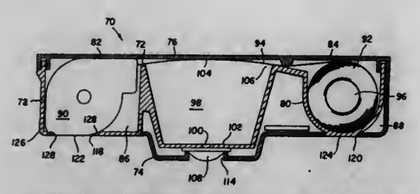
COMPACT ONE-TIME-USE CAMERA

Dwight J. Petruchik, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1997, Ser. No. 832,589
Int. Cl.[6] G03B *17/02*
U.S. Cl. 396—6 **3 Claims**

1. A one-time-use camera comprising a body part which has a wall portion that at least partially defines a cartridge chamber, a film cartridge in said cartridge chamber, and a cover part for said body part, is characterized in that:

said wall portion has an opening which extends through the wall portion to form a discrete hole in the wall portion which is



smaller than said film cartridge to permit only a section of the film cartridge to protrude into the hole to fill the hole;

said film cartridge has a section that protrudes into said hole to fill the hole; and

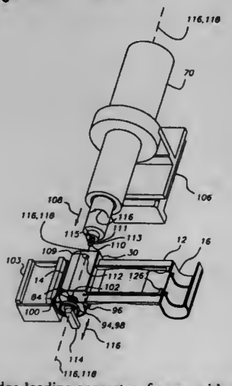
said cover part extends over said body part, but not to said hole, whereby said one-time-use camera is made more compact.

5,815,739

CAMERA ASSEMBLY WITH QUILL DRIVEKEY FOR ENGAGING FILM CARTRIDGE

Stephen D. Marra, Fairport; Duane B. Kirk, Hilton, and Joseph A. Watkins, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1997, Ser. No. 837,632
Int. Cl.[6] B03B *17/02;17/26*
U.S. Cl. 396—6 **14 Claims**



11. An cartridge loading apparatus, for use with a camera frame assembly including a frame having a cartridge chamber, a supply chamber, and an intermediate section between said chambers, said frame assembly including a thumbwheel attached in freely rotatable relation to said frame, said thumbwheel having a rotation member disposed external to said cartridge chamber and a drivekey extending axially into said cartridge chamber; and a film cartridge disposed in said cartridge chamber, said film cartridge including a case, a spool, and a filmstrip, said spool having opposed first and second ends, each said end having a spool engagement portion, said spool engagement portion of said first end being complementary in shape to said thumbwheel drivekey, said filmstrip having an leading portion, a main portion and a tail portion; said apparatus comprising:

a receiver for the camera frame assembly, said receiver defining sites for said chambers and said intermediate section, and a cartridge chamber axis;

a clamping member movable between a non-use position disposed in spaced relation to said frame and a use position wherein said clamping member bears against said thumbwheel and prevents rotation of said thumbwheel relative to said frame;

a cartridge mover disposed in operative relation to said receiver, said cartridge mover being movable over said cartridge chamber site to place said cartridge in said cartridge chamber wherein said engagement portion of said first end of said spool is disposed in close proximity to said drivekey of said thumbwheel; and

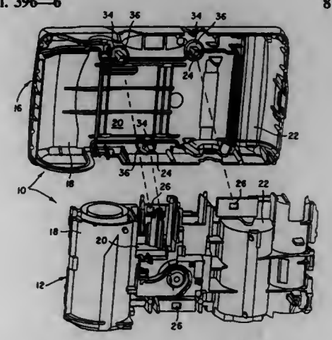
a quill having a drivekey complementary in shape to said engagement portion of said second end of said spool, said quill having an axis of rotation, said quill being reversibly movable along said axis of rotation toward said cartridge chamber to urge said cartridge toward said thumbwheel and matingly engage said drivekeys and respective said engagement portions.

5,815,740

METHOD OF REMANUFACTURING ONE-TIME-USE CAMERA

Bernd Wagner, North Greece, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1997, Ser. No. 862,119
Int. Cl.[6] G03B *17/02*
U.S. Cl. 396—6 **8 Claims**



1. A method of disassembling a one-time-use camera of the type including a continuous line of weakness which circumscribes a predetermined portion of a main body part or a cover part for the main body part to surround the predetermined portion, to permit the predetermined portion to be broken away from the main body part or cover part along the continuous line of weakness and leave a hole within the substance of the main body part or cover part in the place of the predetermined portion, and a connection between the main body part and the cover part at the predetermined portion, which causes the predetermined portion to be broken away from the main body part or cover part when the main body part and the cover part are forcibly pulled apart, said method comprising the step of:

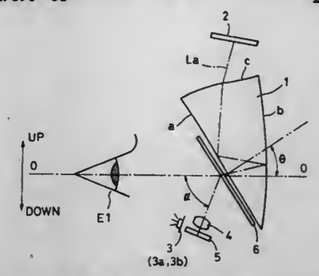
forcibly pulling apart the main body part and the cover part sufficiently to cause the predetermined portion to be broken away from the main body part or cover part along the continuous line of weakness and leave a hole within the substance of the main body part or cover part in the place of the predetermined portion.

5,815,741

IMAGE OBSERVING APPARATUS AND IMAGING APPARATUS UTILIZING THE IMAGE OBSERVING APPARATUS

Atsushi Okuyama, Tokorozawa, and Shouichi Yamazaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 571,193, Dec. 12, 1995, abandoned. This application May 15, 1997, Ser. No. 856,684
Claims priority, application Japan, Dec. 21, 1994, 6-335933
Int. Cl.[6] G03L *7/08;* **A61B** *31/14;* **G03B** *13/02*
U.S. Cl. 396—51 **25 Claims**



1. An image observing apparatus comprising:

an optical element including a first face inclined relative to an observer, a second face comprised of a reflective concave side, and a third face which light from an image enters so as to have overall a positive refractive power;

line-of-sight detecting means for detecting a line of sight of the observer including a light source provided on an observing side of said optical element to illuminate a fore eye portion of the observer and a light receiving means for receiving an image of the fore eye portion; and

light reflecting means, provided in an observing side of the first face, between the first face and the light source, for reflecting the light emanating from the light source,

wherein the light from the image entering the third face is reflected by the first face, is convergently-reflected to a first face side by the second face, and emerges from the first face, and

wherein the light, from the light source, reflected at the fore eye portion of the observer is reflected by said light reflecting means and enters said light receiving means.

5,815,742

APPARATUS HAVING A DRIVEN MEMBER AND A DRIVE CONTROLLER THEREFOR

Masataka Hamada, Osakasayama; Kazuhiko Yukawa, Sakai; Kohtaro Hayashi, Toyonaka, and Tetsuro Kanbara, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jun. 10, 1997, Ser. No. 872,396
Claims priority, application Japan, Jun. 11, 1996, 8-149536; Jun. 11, 1996, 8-149539; Jun. 11, 1996, 8-149541
Int. Cl.[6] G03B *5/00;13/36;* **G05B** *5/00*
U.S. Cl. 396—55 **13 Claims**

1. An apparatus comprising:

a member to be driven;

an actuator that in response to a pulse signal drives said to-be-driven member to move by an amount proportional to a given number of pulses;

a position detector that detects a position of said to-be-driven member in predetermined detection steps;

a controller that determines in steps smaller than said predetermined detection steps a target position up to which said to-be-driven member is to be moved, controls said actuator up to a detection-step position immediately before the target position by closed-loop control in accordance with a detection

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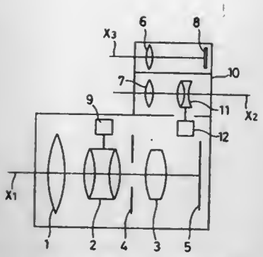


result from said detector, and controls said actuator from that detection-step position to the target position by open-loop control.

5,815,743

FLASH-ASSISTED PHOTOGRAPHING SYSTEM AND A DEVICE FOR USE IN THE SAME

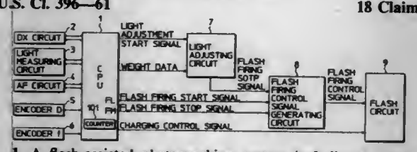
Shigeto Ohmori, Kawachinagano, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 2, 1996, Ser. No. 724,822

Claims priority, application Japan, Oct. 4, 1995, 7-257919; Oct. 13, 1995, 7-265960; Oct. 13, 1995, 7-265961

Int. Cl.[6] G03B *15/02*

U.S. Cl. 396—61 **18 Claims**



1. A flash-assisted photographing system including a camera provided with a taking lens capable of varying the focal length and a flash, the flash-assisted photographing system comprising:

a light receiving unit having a plurality of receiving areas operable to separately receive light reflected by different areas of a photographic view;

a detector operable to detect a focal length of the taking lens; and

a control that includes means for setting weights for outputs of each of the receiving areas based on a detected focal length, said controller further includes means for adding the outputs for the receiving areas which have been weighted by the weights and to stop flash emission upon an addition of the weighted outputs reaching a predetermined value.

5,815,744

DRIVING MECHANISM FOR A PHOTOGRAPHIC LENS

Akio Ohmiya, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Jan. 15, 1997, Ser. No. 784,027

Claims priority, application Japan, Jan. 16, 1996, 8-023173

Int. Cl.[6] G03B *17/00*

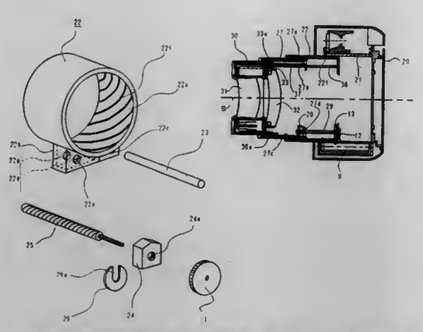
U.S. Cl. 396—72 **7 Claims**

1. A driving mechanism for a photographic lens serving to drive a lens barrel assembly with which the photographic lens is operatively associated back and forth in the direction of an optical axis so that said photographic lens may operate either in a power varying mode or in a focusing mode, said driving mechanism comprising:

an elongated driving gear having gear teeth extending along a length thereof for delivering a rotational driving force;

a first driving lens barrel received by a stationary lens barrel;

linear driving means operably coupled to said elongated driving gear for translating the rotational driving force into a linear



driving force to drive said first driving lens barrel back and forth in the direction of the optical axis without rotating said first driving lens barrel around the optical axis;

a second driving lens barrel received by said first driving lens barrel so as to be movable back and forth in the direction of the optical axis relative to said first driving lens barrel as said second driving lens barrel rotates around the optical axis;

rotational driving means operably coupled to said first driving lens barrel and to said elongated driving gear to be rotated thereby to rotate said second driving lens barrel; and

a movable lens barrel received by said second driving lens barrel so as to be movable back and forth by a predetermined distance in the direction of the optical axis as said second driving lens barrel is rotated around the optical axis, wherein:

a rear lens group is operatively associated with said second driving lens barrel so as to be moved back and forth by a predetermined distance in the direction of the optical axis while a front lens group is operatively associated with said movable lens barrel so as to be moved back and forth together with said movable lens barrel;

said first driving lens barrel supports at a rear end of an inner peripheral surface of said first driving lens barrel, a rear end of a coupling shaft that is moved back and forth together with said first driving lens barrel;

a first gear is fixed to said coupling shaft adjacent the rear end of said coupling shaft so as to rotate and move back and forth integrally with said coupling shaft;

said second driving lens barrel slidably supports at a rear portion thereof, said coupling shaft along a length defined between front and middle portions of said coupling shaft;

said second driving lens barrel is formed with an internal gear;

said coupling shaft slidably supports a second gear adapted to be engaged with said internal gear so as to rotate integrally with said coupling shaft; and

said second driving lens barrel is rotated relative to said first driving lens barrel as said first gear rotates.

5,815,745

CAMERA

Toshifumi Ohsawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 729,075, Oct. 10, 1996, Pat. No. 5,666,570, which is a continuation of Ser. No. 286,802, Aug. 5, 1994, abandoned, which is a continuation of Ser. No. 27,289, Mar. 4, 1993, abandoned. This application May 16, 1997, Ser. No. 857,447

Claims priority, application Japan, Mar. 6, 1992, 4-082986

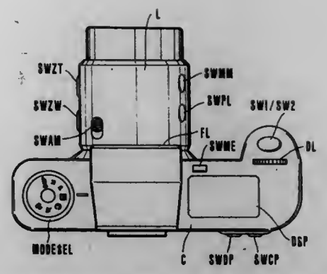
Int. Cl.[6] G03B *13/36*

U.S. Cl. 396—76 **5 Claims**

1. A camera comprising:

a first driving mechanism for driving a focusing lens;

a second driving mechanism for driving a zooming lens;



first detecting means for detecting a position of said focusing lens;

second detecting means for detecting a position of said zooming lens;

a memory circuit for memorizing a position of said focusing lens and a position of said zooming lens in response to an operation of a first operating member; and

controlling means for forcedly driving said first and second driving mechanisms in response to an operation of a second operating member and moving said focusing lens and said zooming lens to said respective positions memorized by said memory circuit.

5,815,746

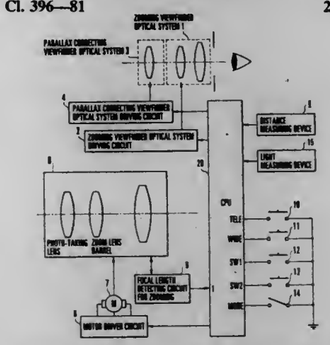
PARALLAX CORRECTION APPARATUS

Hidetoshi Masuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1997, Ser. No. 785,894

Int. Cl.[6] G03B *13/14*

U.S. Cl. 396—81 **228 Claims**



1. A parallax correction apparatus for a viewfinder, comprising:

a) a parallax correcting device which corrects a parallax of a viewfinder;

b) a focal length varying device which varies said viewfinder; and

c) a control device which computes a parallax correction signal on the basis of a focusing distance and a focal length of an image forming optical system and controls said parallax correcting device in accordance with the parallex correction signal, said control device controlling said focal length varying device in accordance with the focal length of the image forming optical system, said control device restraining an operation of said parallax correcting device while allowing an operation of said focal length varying device.

5,815,747

CAMERA HAVING AUTOFOCUS FUNCTION INDEPENDENT OF PHOTOGRAPHING OPTICAL SYSTEM

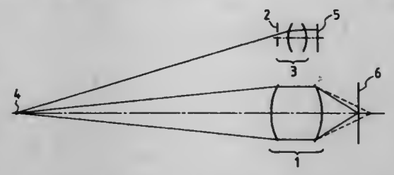
Akira Mori, Kawasaki; Atsujiro Ishii, Houya; Masahiro Suzuki, Hachioji, and Hironori Shibata, Mobara, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1996, Ser. No. 715,620

Claims priority, application Japan, Dec. 28, 1995, 7-343268

Int. Cl.[6] G03B *13/00;13/36*

U.S. Cl. 396—91 **2 Claims**



1. A camera having an autofocus function which is independent of a photographing optical system, comprising:

a photographing optical system including synthetic resin lenses; and

an autofocus optical system which is separate from the photographing optical system,

wherein said autofocus optical system includes a first optical unit having at least one synthetic resin lens and a stop, said stop being movable and defining a central axis, said stop being disposed such that said central axis is displaced a distance in a direction perpendicular to an optical axis of said at least one synthetic resin lens, and

said photographing optical system has a variable magnification function said stop is moved to vary and a positional relationship between said at least one synthetic resin lens and said stop of said first optical unit constituting said autofocus optical system in association with variable magnification behavior of said photographing optical system.

5,815,748

CAMERA

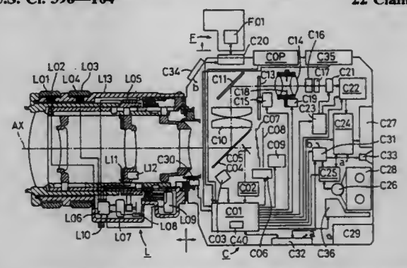
Toshihiro Hamamura, Osaka; Tsutomu Honda, and Kiyoshi Seigenji, both of Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 14, 1997, Ser. No. 801,072

Claims priority, application Japan, Feb. 15, 1996, 8-027666; Apr. 8, 1996, 8-085109; May 9, 1996, 8-114560; May 9, 1996, 8-114561; May 9, 1996, 8-114563

Int. Cl.[6] G03B *13/36;17/48;* **H04N** *7/18*

U.S. Cl. 396—104 **22 Claims**



1. A camera that receives a light beam from an object through a main optical system to shoot an image formed by the light beam, comprising:

a first shooting device for shooting an image formed by a light beam having passed through said main optical system;

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a second shooting device, provided separately from said first shooting device, for shooting an image formed by a light beam having passed through said main optical system;

a first detector for detecting a focus condition of an image in said first shooting device; and

a second detector, provided separately from said first detector, for detecting a focus condition of an image in said second shooting device.

5,815,749

CONTROL DEVICE FOR PREVENTING RED-EYE EFFECT ON CAMERA

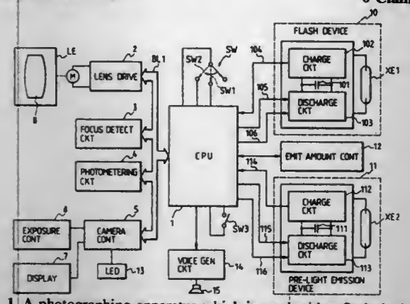
Daiki Tsukahara, Kawasaki; Kiyosada Machida, Urawa; Noriyasu Kotani, Okegawa; Minoru Kato, Kawasaki, and Hideya Inoue, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 483,963, Jun. 7, 1995, Pat. No. 5,717,963, which is a division of Ser. No. 71,613, Jun. 4, 1993, which is a continuation of Ser. No. 974,512, Nov. 12, 1992, abandoned, which is a division of Ser. No. 930,466, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 785,210, Oct. 25, 1991, abandoned, which is a continuation of Ser. No. 632,648, Dec. 26, 1990, abandoned, which is a continuation of Ser. No. 445,996, Dec. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 323,386, Mar. 14, 1989, abandoned. This application Jun. 26, 1997, Ser. No. 883,311

Claims priority, application Japan, Mar. 25, 1988, 63-72237

Int. Cl.[6] G03B *15/05;17/40*

U.S. Cl. 396—158 **6 Claims**



1. A photographing apparatus which is used with a flash device which emits flash for illuminating an object to be photographed, including a person, at the time of exposure, comprising:

a self-timer device which is made operative upon manual operation, and which counts a predetermined time from the start of the manual operation and causes said photographing apparatus to effect exposure after completion of counting of the predetermined time; and

a pre-illumination device which is made operable upon said manual operation and which emits light toward said object, before said flash device emits flash at the time of exposure, for causing pupils of said person's eyes to contract.

5,815,750

CAMERA HAVING A FINGER DETECTING DEVICE

Minoru Ishiguro, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan

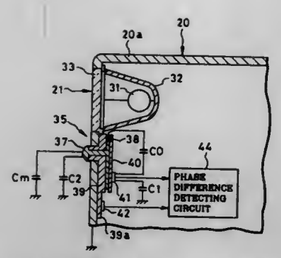
Filed Aug. 22, 1997, Ser. No. 916,227

Claims priority, application Japan, Sep. 2, 1996, 8-231822

Int. Cl.[6] G03B *17/38*

U.S. Cl. 396—201 **9 Claims**

9. A camera having a finger detecting device for indirectly detecting that a finger contacts a window for emitting light or receiving light, said finger detecting device comprising:



a conductive member bared at a near portion of said window and to outside of said camera;

an auxiliary electrode integrally provided with said conductive member and disposed in said camera;

a detecting electrode facing said auxiliary electrode; and

a detecting circuit for detecting whether said finger contacts said conductive member on the basis of a change of capacity of said detecting electrode.

5,815,751

CAMERA LOADABLE WITH FILM CARTRIDGE HAVING FILM PHOTOGRAPHING INFORMATION

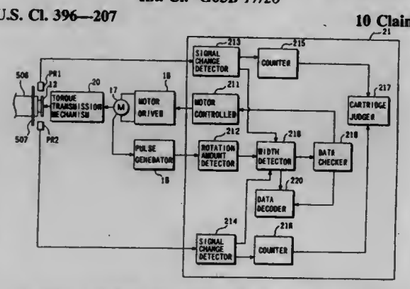
Akira Ogino, Osaka, and Ryuichi Yasuhara, Sakai, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 20, 1997, Ser. No. 803,470

Claims priority, application Japan, Feb. 21, 1996, 8-034097

Int. Cl.[6] G03B *17/26*

U.S. Cl. 396—207 **10 Claims**



1. A camera loadable with a film cartridge having a rotary spool connected with a film and a bar code disk rotatable with the rotary spool and provided with a bar code for indicating photographing information of the film, the camera comprising:

a fork engageable with the rotary spool when the film cartridge is loaded;

a motor which rotates the fork to rotate the rotary spool;

a reader which reads the bar code on the bar code disk to produce a read signal;

a code data generator which generates code data based on a read signal;

a decoder which decodes generated code data into photographing information of the film; and

a controller which controls the code data generator to generate code data based on a read signal produced by the reader after the bar code disk rotates together with the rotary spool a predetermined rotation amount.

5,815,752

CAMERA HAVING A MAGNETIC RECORDING APPARATUS SELECTIVELY OPERABLE BASED ON FILM FEED SPEED

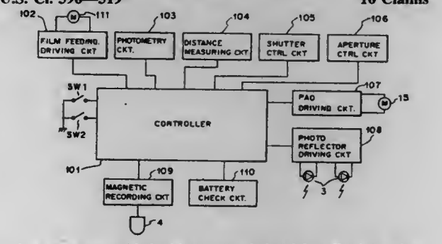
Hideo Tamamura, Yokohama, and Chikara Aoshima, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 281,119, Jul. 28, 1994, abandoned, which is a continuation of Ser. No. 758,611, Sep. 12, 1991, abandoned. This application Nov. 16, 1994, Ser. No. 342,010

Claims priority, application Japan, Sep. 13, 1990, 2-243625; Nov. 7, 1990, 2-299821

Int. Cl.[6] G03B *17/24*

U.S. Cl. 396—319 **16 Claims**



1. A camera provided with a magnetic head for effecting at least one of (i) writing information onto a magnetic portion of a film and (ii) reading information from the magnetic portion, said camera comprising:

means for feeding the film, which is contained in a cartridge;

a photographing control circuit, said circuit comprising a feeding circuit for causing said feeding means to feed the film and an exposure control circuit for controlling photographing of each frame of the film;

a magnetic control circuit for causing the magnetic head to perform at least one of a writing operation and a reading operation during film feeding; and

a processing circuit, said circuit detecting an output of a power source circuit, and when the output of the power source circuit is equal to or higher than a first value, said processing circuit permitting said feeding circuit and said exposure control circuit to operate, causing said magnetic control circuit to operate when film feeding is performed by operation of said feeding circuit, and causing one of a writing operation and a reading operation to be performed, photographing of each frame being controlled by said exposure control circuit,

and when the output of the power source circuit is lower than the first value, said processing circuit permitting said feeding circuit and said exposure control circuit to operate, and inhibiting said magnetic control circuit from operating, and causing the film feeding to be performed by said feeding circuit, the photographing of each frame being controlled by said exposure control circuit without at least one of the writing operation and the reading operation.

5,815,753

CAMERA HAVING A MAGNETIC INFORMATION RECORDING APPARATUS AND RECORDING CONTROL MEANS

Kenichiro Amano, Kawasaki, Japan, assignor to Caono Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 443,271, May 17, 1995, abandoned. This application Jul. 31, 1997, Ser. No. 904,447

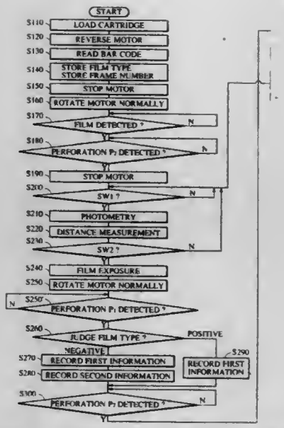
Claims priority, application Japan, May 23, 1994, 6-130808

Int. Cl.[6] G03B *17/24*

U.S. Cl. 396—319 **20 Claims**

1. A camera having a recording head for recording information in a magnetic recording area provided on a film, comprising:

an information recording control circuit operable in a first mode for controlling said recording head to record predetermined



information in said magnetic recording area, and in a second mode for controlling said recording head to prohibit recording of said predetermined information, and wherein said control circuit also controls said recording head to record other information different from said predetermined information in the second mode; and

a selection circuit for selecting the first mode or the second mode according to the type of film loaded in said camera.

5,815,754

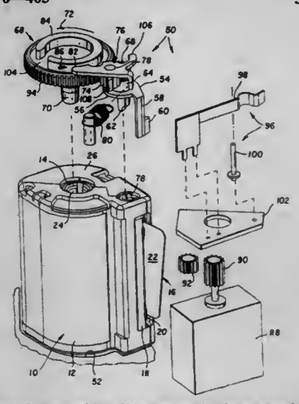
CLOSING LIGHT LOCK OF FILM CASSETTE TURNS OFF FILM-WIND-INTO-CASSETTE MOTOR, IN ONE-TIME-USE CAMERA

Edward N. Balling, Rochester; Joel S. Lawther, East Rochester, and Thomas E. Dussinger, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1997, Ser. No. 856,298

Int. Cl.[6] G03B *1/18*

U.S. Cl. 396—403 **3 Claims**



1. A camera for use with a film cassette having a spool rotatable to wind an exposed filmstrip including a trailing film end portion into the cassette and a light lock movable to be closed after the trailing film end portion is wound into the cassette, comprising a

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film winder rotatable in engagement with the spool in a film winding direction to rotate the spool in the same direction to wind the exposed filmstrip including the trailing film end portion into the cassette, and a locking device coupled with the light lock for movement to prevent further rotation of said film winder in the film winding direction when the light lock is closed, is characterized in that:

a drive motor is drivingly connected with said film winder to rotate the film winder in the film winding direction; and

a motor switch capable of changing state to turn off said drive motor is positioned with respect to said locking device for movement of the locking device to prevent further rotation of said film winder in the film winding direction when the light lock is closed to cause said motor switch to change state to turn off said drive motor.

5,815,755

CAMERA AND METHOD FOR SETTING A USED-STATE DISPLAY

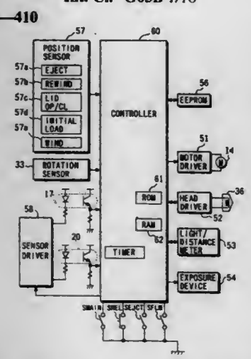
Hidekazu Nakajima, Higashiosaka, and Takahiro Ikeda, Kawachinagano, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 13, 1997, Ser. No. 799,881

Claims priority, application Japan, Feb. 21, 1996, 8-033798; Feb. 21, 1996, 8-033799

Int. Cl.[6] G03B *1/18*

U.S. Cl. 396—410 **19 Claims**



1. A camera loadable with a film cartridge having a rotary spool connected with a film and a display member rotatable with the rotary spool for displaying a used state of the film, the camera comprising:

a driver which generates a driving force for rotation of the rotary spool;

a transmission device which is operable to execute transmission of the driving force from the driver to the rotary spool; and

a controller which controls the transmission device to execute the transmission of the driving force to rotate the rotary spool for rewinding of the film into the film cartridge, and to suspend the transmission of the driving force to allow the rewound film to freely loosen, and to subsequently execute the transmission of the driving force to rotate the rotary spool until the display member reaches a position to display a specified used state of the film.

5,815,756

FILM POSITIONING APPARATUS

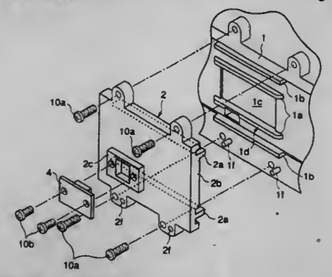
Noboru Akami, Yokohama, and Isao Soshi, Setagaya, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 563,549, Nov. 28, 1995, abandoned. This application Jun. 6, 1997, Ser. No. 870,266

Claims priority, application Japan, Dec. 15, 1994, 6-311970

Int. Cl.[6] G03B *17/00*

U.S. Cl. 396—440 **5 Claims**



1. A camera comprising:

a camera body formed with an aperture to expose a film; and

a connecting mechanism; and

a positioning member having positioning portions to position the film fed to said exposure aperture in a crosswise direction parallel to a surface of the film, said positioning member being connected to said camera body through said connecting mechanism wherein

said positioning member has a mounting member for a separate member to be disposed in a predetermined positional relationship in the crosswise direction with respect to the film, and wherein

said positioning member and said camera body include portions that interlock to prevent stray light from impinging on the film.

5,815,757

ADJUSTABLE TAKING LENS ASSEMBLY

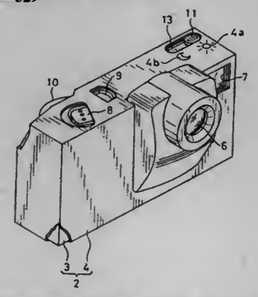
Hirofumi Katsura; Fuminori Kawamura, both of Kanagawa; Hideo Sasajima, Ibaragi, and Yukihiko Yamaguchi, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, and Fuji Photo Optical Co., Ltd., Saitama, both of Japan

Division of Ser. No. 560,401, Nov. 17, 1995, Pat. No. 5,721,995, which is a continuation-in-part of Ser. No. 385,136, Feb. 7, 1995, abandoned. This application Aug. 19, 1997, Ser. No. 914,279

Claims priority, application Japan, Feb. 10, 1994, 6-16567; Apr. 14, 1994, 6-75884; Apr. 15, 1994, 6-77583

Int. Cl.[6] G03B *17/00*

U.S. Cl. 396—529 **2 Claims**



1. In a lens-fitted photographic film unit previously loaded with

unexposed photographic film and having a taking lens, the improvement wherein:

said taking lens is assembled into a taking lens unit comprising a lens assembly, a lens barrel portion for holding said lens assembly and a lens cover for securing said lens assembly in said lens barrel portion, said lens assembly comprising at least a lens element and a lens frame fixedly holding said lens therein; and

three spiral cam rails are formed on an inside surface of said lens barrel portion, and said lens frame has three spiral ridges on its outer periphery, one sides of which are slidably fitted on said three spiral cam rails, such that said lens assembly is moved axially inside said lens barrel portion when it is rotated.

5,815,758

CAMERA

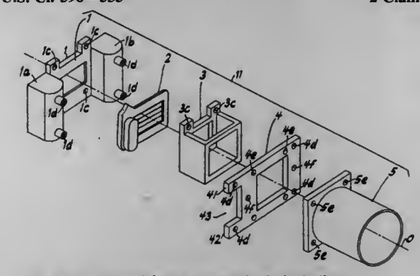
Hiroshi Terada, Mitaka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 271,342, Jul. 6, 1994, abandoned. This application Sep. 10, 1996, Ser. No. 711,820

Claims priority, application Japan, Jul. 6, 1993, 5-167214

Int. Cl.[6] G03B *17/02*

U.S. Cl. 396—535 **2 Claims**



1. A camera comprising: a camera body including:

a rigid board,

a main body unit made of a plastic material and mounted on the rigid board, and

a taking lens unit mounted on the rigid board;

a first casing unit for covering the camera body, the first casing unit abutting the camera body; and

a second casing unit for covering the camera body, the second casing unit abutting the camera body to prevent the camera body from moving along a direction perpendicular to the optical axis of the taking lens unit, and the second casing unit being connected to the first casing unit,

whereby the camera body is caught between the first and the second casing units,

wherein the taking lens unit is located between the rigid board and the main body unit.

5,815,759

EXTENDED ADJUSTING MECHANISM FOR THE LENS SET OF AN IMAGING SYSTEM

Kou-Long Tseng, Hsinchu; Chien-Chin Chan, ChuPei; Guang-Shang Chang, Taichung; Chin-Shui Lin, YungHo; Chih-Wen Pan, Taipei, and Chi-Wen Lin, Hsinchu, all of Taiwan, assignors to Umax Data System, Hsinchu, Taiwan

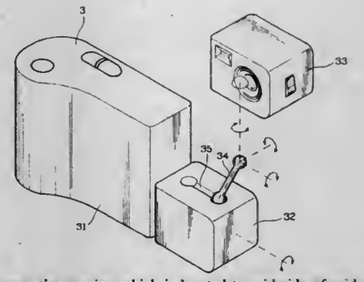
Filed Mar. 26, 1998, Ser. No. 48,956

Int. Cl.[6] G03B *17/02*

U.S. Cl. 396—541 **14 Claims**

1. An extended adjusting mechanism for the lens set of an imaging system, which is applied to one side of the main body of said imaging system, comprising:

a lens set for viewing and recording; and



a connection carrier, which is located to said side of said main body of said imaging system as a carrier for said lens set, further comprising:

a base, which is a carrier block connected rotationally to said side of said main body by a hollow pivot shaft; and

a dumb-bell connection as a junction means between said base and said lens set, which is a hollow bar with a ball joint at one end whichof connecting to said lens set.

5,815,760

MODE SELECTING SWITCH FOR CAMERA

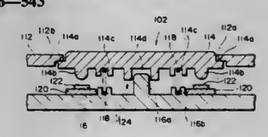
Toru Ito; Jun Hiraku, and Nobuhiro Aoki, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

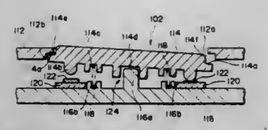
Filed Jul. 15, 1997, Ser. No. 892,990

Claims priority, application Japan, Sep. 17, 1996, 8-244998; Sep. 17, 1996, 8-244999

Int. Cl.[6] G03B *17/38*

U.S. Cl. 396—543 **12 Claims**





5. A switch for a camera comprising:

a switch button having a plurality of contact-pushing sections and an edge portion;

a plurality of contacts disposed at positions opposing the contact-pushing sections of said switch button;

an exterior part of the camera; and

urging means for urging

said edge portion into abutment with an interior surface of said exterior part,

said switch button being pivotable as a body about said edge portion with said edge portion abutting said interior surface of said exterior part to bring any one of said contact-pushing sections into and out of engagement with a corresponding one of said contacts.

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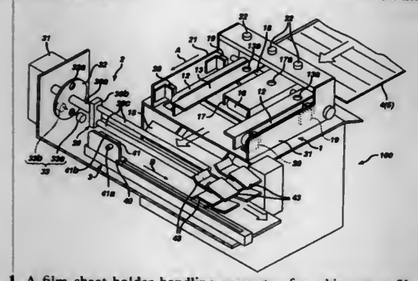
5,815,761

FILM SHEET HOLDER HANDLING APPARATUS AND METHOD OF HANDLING FILM SHEET HOLDER

Yuji Haruta, and Nobuaki Nakaoka, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Jan. 9, 1997, Ser. No. 780,873
Claims priority, application Japan, Jan. 12, 1996, 8-003514
Int. Cl.[6] G03D *13/00;3/08*
U.S. Cl. 396—567 **11 Claims**



1. A film sheet holder handling apparatus for taking up a film sheet holder in which photographer film strips cut for one order amount are stored, comprising:

take-up means for taking up the film sheet holder by a predetermined amount corresponding to a certain number of rows of the film sheet holder;

film detecting means for detecting the presence or absence of the film within the transported film sheet holder before the holder is taken up by the take-up means;

transporting means for transporting the film sheet holder to the take-up means along a transport passage when the film detecting means detects presence of the film; and

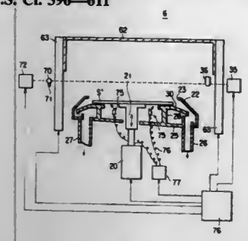
second discharging means for discharging the film sheet holder from the transport passage when the film detecting means detects absence of the film.

5,815,762

PROCESSING APPARATUS AND PROCESSING METHOD

Mitsuhiro Sakai; Masafumi Nomura, both of Kumamoto-ken, and Kazuaki Tsunoda, Kumamoto, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jun. 19, 1997, Ser. No. 878,960
Claims priority, application Japan, Jun. 21, 1996, 8-181170
Int. Cl.[6] G03D *5/04*
U.S. Cl. 396—611 **30 Claims**



1. A processing apparatus comprising:

a processing unit for containing a substrate;

a processing solution supply nozzle arranged above the substrate;

a processing solution storage formed inside said supply nozzle and having an upper surface consisting of at least one inclined surface;

a supply passage for supplying a solution into said solution storage;

a plurality of eject holes formed in a lower surface of said supply nozzle to eject the processing solution in said solution storage; and

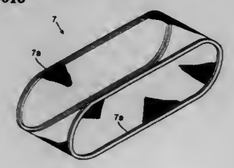
an exhaust port formed in a high portion of said inclined surface of said solution storage.

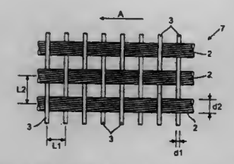
5,815,763

CONVEYING APPARATUS FOR PHOTOSENSITIVE MATERIAL

Kenji Todoki, Wakayama-ken, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Mar. 24, 1997, Ser. No. 822,017
Claims priority, application Japan, Mar. 28, 1996, 8-073543
Int. Cl.[6] G03D *3/08*
U.S. Cl. 396—618 **5 Claims**





1. A conveying apparatus for photosensitive material provided with a mesh belt for conveying a developed photosensitive material to be dried in a drier section, wherein

a thickness of threads comprising said mesh belt is within the range of 0.1 mm to 1.0 mm;

a mesh size does not exceed 5 mm; and

a ratio of the open area of the mesh to a total area of said mesh belt is within the range of 20% to 60%.

5,815,764

DOCUMENT JOB ROUTING SYSTEM FOR A PRINTING SYSTEM

Ronald S. Tomory, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 721,513
Int. Cl.[6] G03G *15/00;21/00*
U.S. Cl. 399—1 **9 Claims**

1. In a printing system having a plurality of output areas and an image capture subsystem for reading a hardcopy document with

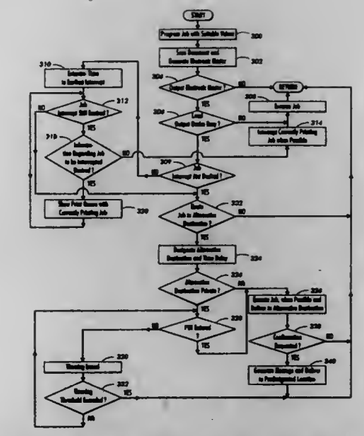


image related information, the printing system further including a first memory location at which a first job, including a first set of image data, is stored and a print engine for producing a first set of prints based on the first set of image data stored at the first memory location, a method for routing a second set of image data of a second job to a second memory location for eventual output at a selected one of the plurality of output areas while the prints of the first set of prints are being produced with the first set of image data of the first memory location, comprising the steps of:

a) directing the image capture subsystem to create the second set of image data of the second job from a hardcopy document having image related information;

b) receiving, at a user interface associated with the printing system, a set of information indicating to a user of the printing system that the print engine is busy producing the first set of prints with the first set of image data of the first memory location; and

c) in response to receiving the set of information, a user of the printing system directing a controller associated with the printing system to,

(i) cause a second set of prints, representative of the second set of image data, to be produced subsequent to producing the first set of prints from the first set of image data, and

(ii) cause the prints of the second job to be delivered to the selected one of the plurality of output areas, subsequent to said producing of the first set of prints.

5,815,765

METHOD OF DRAWING OUT PAPER FROM LASER PRINTER WHEN JAM OCCUR

Byung-Oh Park, Kyungkdo, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

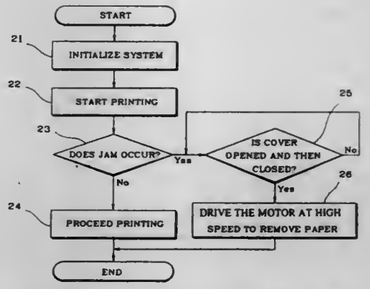
Filed Apr. 18, 1997, Ser. No. 844,343
Claims priority, application Rep. of Korea, Apr. 18, 1996, 1996/11760
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—18 **13 Claims**

1. A method of removing a cut sheet of paper from a laser printer when a paper jam occurs, comprising the steps of:

starting a printing activity after initialization of said laser printer in preparation for printing images upon cut sheets of paper conveyed along a path through the printer;

supplying one of the cut sheets of paper, from a paper cassette, to said laser printer via a feeding roller;

conveying the cut sheet of paper along a path by driving a printing mechanism motor of said laser printer at a first motor speed;



when a paper jam occurs, ascertaining whether said paper jam occurred during said printing activity;

when said paper jam does not occur during said printing activity, proceeding with said printing activity;

creating a visual image from an electrostatic latent image attracting a toner to be fused to the paper according to electric potential differences on a photosensitive drum;

charging a photosensitive drum;

developing an electrostatic latent image by exposing a surface of said photosensitive drum to a plurality of light;

developing a visual image from the electrostatic latent image on the photosensitive drum using a developer;

transferring a developed image on said photosensitive drum to the cut sheet of paper;

fusing said developed image to the cut sheet of paper by successively passing the cut sheet of paper against a heating roller and a compression roller, and discharging said cut sheet of paper from said laser printer;

when said paper jam occurs during said printing activity, ascertaining whether a cover of said laser printer is opened and then closed; and

when said cover of said laser printer has been opened and then closed after occurrence of said paper jam, driving said printing mechanism motor of said laser printer at a second motor speed greater than said first motor speed to eject said cut sheet of paper.

5,815,766

METHOD AND APPARATUS FOR CLEAN CONVENIENT COPY SHEET JAM CLEARANCE IN AN ELECTROSTATOGRAPHIC MACHINE

Eugene F. Miller, Fairport, and Patrick T. Pendell, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1997, Ser. No. 831,449
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—21 **7 Claims**

1. In an electrostatographic reproduction process machine having means for forming a toner image, a copy sheet handling system, an image transfer station for transferring the toner image to a transported and registered copy sheet, a fuser for fusing and affixing the toner image to the copy sheet, and a programmable control system, a method of cleanly and conveniently controlling and enabling clearing of a jammed copy sheet from the sheet handling system, the method comprising:

(a) detecting an error in copy sheet movement;

(b) determining a first actual position within the handling system of a sheet having a lead edge thereto closest to the image transfer station of the machine;

(c) identifying a location of such lead edge in relation to a first sensing device upstream, relative to sheet movement, of the image transfer station and in relation to a second sensing device downstream, relative to sheet movement, of the image transfer station;

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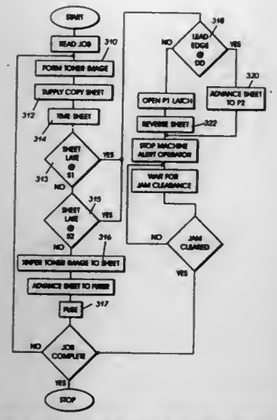


(d) actuating a solenoid switch to open up a latching portion of a copy sheet path portion, upstream of the first sensing device, relative to the initial forward movement of the copy sheet;

(e) automatically changing a position of the sheet from the first actual position to a new and convenient sheet removal position, depending on the location of such lead edge as identified in said identifying step; and

(f) stopping the machine following said automatically change step, and alerting an operator of a copy sheet to be removed from the sheet handling system.

5,815,767

IMAGE FORMING APPARATUS

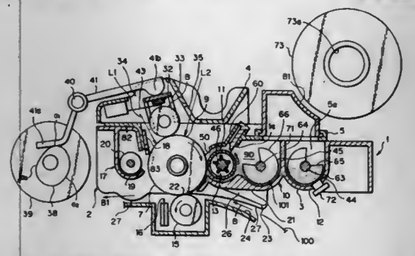
Akio Kutsuwada, Kawasaki; Masaru Tanaka, Yokohama; Takeo Suda, Tokyo; Mitsuru Sato, Matsudo; Toshitaka Yamaguchi, Omiya, and Kenzou Tatsumi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 648,921, May 16, 1996, Pat. No. 5,678,125. This application May 16, 1997, Ser. No. 857,899

Claims priority, application Japan, May 17, 1995, 7-142648; May 19, 1995, 7-145479

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—25 **30 Claims**



1. In an image forming apparatus for forming a toner image on an image carrier and transferring the toner image to a recording medium conveyed toward said image carrier, said apparatus having at least one of image forming elements thereof, including said image carrier, mounted on a single unit casing to thereby form an image forming unit, and having said image forming unit removably mounted on a body of said apparatus, said unit casing of said image forming unit being positioned such that a lower portion of said unit casing forms a guide portion with ribs for guiding the recording medium being conveyed, and a plurality of projections extending out from said lower portion of said unit casing further than said guide portion at an outside of a range in which the recording medium passes to prevent the ribs of said guide portion from contacting an opposite surface.

5,815,768

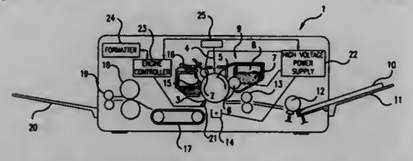
DETECTION OF TONER DEPLETION IN AN ELECTROPHOTOGRAPHIC PRINTING SYSTEM

George B. Clifton, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1997, Ser. No. 810,317

Int. Cl.[6] G03G *15/08*

U.S. Cl. 399—27 **20 Claims**



1. In an electrophotographic imaging system including an optical density sensor for measuring the optical density of toner developed onto an area of a photoconductor, a power supply having a first output to provide a first voltage, and a developer for developing said toner coupled to said first output, a method for detecting the depletion of said toner comprising the steps of:

developing said toner onto said area of said photoconductor in one of a plurality of pre-defined patterns using said developer;

measuring said optical density of said toner developed onto said area of said photoconductor using said optical density sensor to generate an optical density measurement;

performing a plurality of said developing step and said measuring step to generate a plurality of said optical density measurement; and

detecting a condition in which useable amounts of said toner have been completely consumed using said plurality of said optical density measurement.

5,815,769

Patent Not Issued For This Number

5,815,770

IMAGE FORMING APPARATUS WITH INTERRUPTION FUNCTION

Noboru Ogino, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1997, Ser. No. 928,338

Claims priority, application Japan, Sep. 20, 1996, 8-250041

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—87 **16 Claims**

1. An image forming apparatus, comprising:

means for reading images of a plurality of original documents to generate image data;

means for storing image data generated by the reading means;

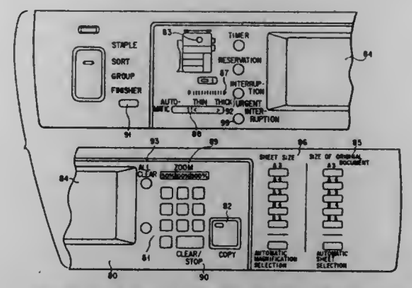
means for forming images on an image forming medium on the basis of the image data so as to obtain a first set of image forming mediums and a second set of image forming mediums sequentially;

first instruction means for instructing an interruption process;

first process means for delaying the interruption process, when the interruption process has been instructed by the first instruction means while the image forming means is obtaining the first set of image forming mediums, until the image forming operation for the first set of the image forming mediums is completed, and for enabling the other image forming operation by the image forming means after the image forming operation for the first set of the image forming mediums and before the image forming operation for the second set of the image forming mediums;

second instructing means for instructing an urgent interruption process; and

second process means for interrupting the image forming operation even while the image forming means is obtaining the first set of image forming mediums when the urgent interruption process is instructed, and for enabling the other image forming operation by the image forming means.



5,815,771

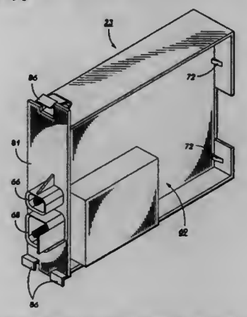
APPARATUS FOR APPLYING A HIGH VOLTAGE ELECTRICAL POINT OF LOAD CONTACT

Kisan S. Dhande, Webster; James R. Bryce; Bruce D. Caryl, both of Fairport; Timothy A. Cole, Henrietta; Elizabeth D. Diebl; Ihor Kulbida, both of Fairport, all of N.Y., and Fernando P. Yulo, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1997, Ser. No. 838,632

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—90 **20 Claims**



1. A printing machine having multiple distributed high voltage power supplies, comprising:

a print engine having a plurality of high voltage electrical printing machine components;

a housing to support at least one of the high voltage power supplies;

at least one receptacle mounted on said housing for receiving an external connector of one of said machine components, wherein said receptacle is fixed on said housing and is not detachable from said housing;

a first contact located inside said receptacle for electrically connecting circuitry of one of said power supplies supported by said housing to said external connector; and

a second contact affixed to said housing for electrically connecting circuitry of one of said power supplies supported by said housing to a second external connector on the machine component.

5,815,772

DRIVING SYSTEM FOR A DETACHABLE UNIT AND OF USING SAME

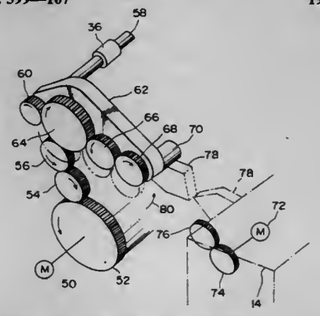
Naomasa Saito, Toyokawa; Toshimitsu Shimizu, Toyohashi, and Taira Suzuki, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 7, 1996, Ser. No. 745,188

Claims priority, application Japan, Nov. 13, 1995, 7-294314

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—107 **19 Claims**



1. An image processing system, comprising:

(a) a main image processing unit; and

(b) an auxiliary unit detachably attached to the main image processing unit and including a first drive source; said main image processing unit including:

a mechanism for transporting a sheet;

a second drive source; and

a transmission which transmits a power from the first drive source to the sheet transporting mechanism when the auxiliary unit is attached to the main image processing unit and transmits a power from the second drive source to the sheet transporting mechanism when the auxiliary unit is not attached to the main image processing unit.

5,815,773

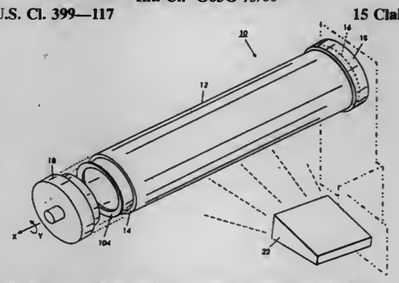
COMPOSITE PHOTORECEPTOR FLANGE

Kamran U. Zaman, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1997, Ser. No. 883,990

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—117 **15 Claims**



9. An electrophotographic imaging system comprising:

a) a source capable of generating a rotational force;

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b) an end flange communicating with said source such that said rotational force is translated to said end flange, said end flange being made from a composite material which includes polycarbonate, polytetrafluorethylene, and glass;

d) a circular photoreceptor mounted to said end flange, thereby causing rotation of said end flange; and

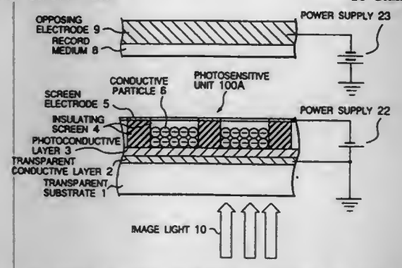
e) an electrically conductive substance mounted between said photoreceptor and said end flange to provide a grounding contact for said photoreceptor.

5,815,774

IMAGE RECORDING APPARATUS WITH PHOTOSENSITIVE UNIT HAVING POROUS INSULATING SCREEN

Yasuhiro Funayama, and Tsutomu Uezono, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 24, 1997, Ser. No. 788,299
Claims priority, application Japan, Jan. 26, 1996, 8-011804
Int. Cl.[6] G03G *15/24*
U.S. Cl. 399—159 **16 Claims**



1. An image recording apparatus for recording an image by attaching conductive color particles to a record medium, comprising:

a rotating photosensitive unit including in a following sequence: a transparent conductive layer, a photoconductive layer, a porous insulating screen and an electrode layer formed on a top surface of said porous insulating screen;

particle supplying means for supplying conductive color particles charged to a given polarity to a plurality of minute holes formed in said porous insulating screen;

potential applying means for applying a predetermined electric potential to said electrode layer on the top surface of said porous insulating screen so that said electrode layer returns said conductive color particles supplied from said particle supplying means;

electric field applying means for applying an electric field to a portion between said transparent conductive layer and said electrode layer to cause a photoconductive phenomenon;

an exposing device for performing an exposing process on an exposing position, by irradiating said photoconductive layer of said photosensitive unit with a light selectively so as to generate the photoconductive phenomenon, said exposing process being performed after said particles supplying means supplies said charged conductive color particles to said minute holes; and

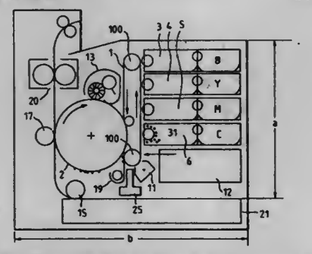
a transferring means for transferring said conductive color particles in said minute holes at the exposing position to the recording medium by means of an electric field, the transferring means arranged opposite to said photosensitive unit.

5,815,775

COLOR ELECTRO-PHOTOGRAPHIC APPARATUS

Toru Miyasaka; Masashi Yamamoto, both of Hitachi; Nobuyoshi Hoshi, Hatachinaka, and Seiji Maruo, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 412,122, Mar. 28, 1995, Pat. No. 5,666,599. This application Jun. 6, 1997, Ser. No. 870,594
Claims priority, application Japan, Apr. 6, 1994, 6-068295; Sep. 5, 1994, 6-210931
Int. Cl.[6] G03G *15/01;15/14*
U.S. Cl. 399—162 **24 Claims**



19. A color electro-photographic apparatus, comprising:

a photosensitive belt disposed for movement along a path in which a major portion of the path extends in a substantially vertical direction;

a plurality of developing units stacked along one side of said photosensitive belt; and

an intermediate transfer body adjacent an other side of said photosensitive belt at a lower portion thereof;

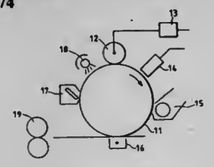
wherein said photosensitive belt moves in an upward direction along said plurality of developing units.

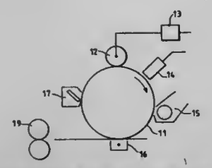
5,815,776

ELECTROPHOTOGRAPHIC APPARATUS WITH PHOTORECEPTOR HAVING UNDERCOAT LAYER, CONTAINING AN ELECTRONIC TRANSPORTING PIGMENT AND REACTIVE ORGANOMETALLIC COMPOUND

Hidemi Nukada, Minami-ashigara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 561,231, Nov. 21, 1995, Pat. No. 5,658,702. This application May 12, 1997, Ser. No. 854,345
Claims priority, application Japan, Nov. 22, 1994, 6-311332
Int. Cl.[6] G03G *15/02*
U.S. Cl. 399—174 **20 Claims**





1. An electrophotographic apparatus comprising:

a negative-electrification electrophotographic photoreceptor comprising an electrically conductive support having thereon an undercoat layer and a photosensitive layer, wherein said undercoat layer comprises an electron-transporting pigment and a chemical product of a hydrolysis reaction of a reactive organometallic compound, said electron-transporting pigment comprising at least one member selected from the group consisting of a polycyclic quinone pigment, a perylene pigment, an azo pigment, a phthalocyanine pigment, an indigo pigment and a quinacridone pigment;

a charging member disposed so as to be in contact with said photoreceptor and which charges the photoreceptor upon application of a voltage to the charging member; and

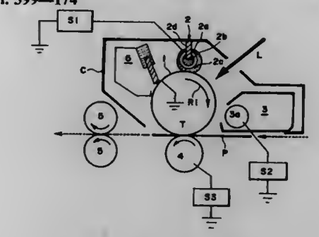
an erase device.

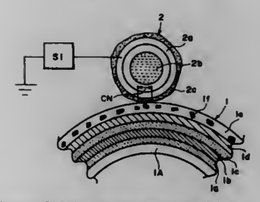
5,815,777

IMAGE FORMING APPARATUS

Jun Hirabayashi, Numazu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1997, Ser. No. 870,725
Claims priority, application Japan, Jun. 7, 1996, 8-146139
Int. Cl.[6] G03G *15/02*
U.S. Cl. 399—174 **5 Claims**





1. An image forming apparatus comprising:

an image bearing member including a surface layer having a volume resistivity which changes with intensity of an electric field;

image forming means for forming, on said image bearing member, an electrostatic image comprising a portion of dark potential VD (V) and a portion of light potential VL (V) with a resolution of A (dot/micron) said image forming means including a charging member contactable to said image bearing member to charge said image bearing member by applying a voltage to said charging member;

wherein the volume resistivity RDL (Ohm.cm) of the surface layer under the electric field of |VD−VL|×A, is larger than 1.0×10^{11} (Ohm.cm), and is not less than twice as large as RD which is a volume resistivity of the surface layer (Ohm.cm) under the electric field of VD×A, and the volume resistivity RD is smaller than 2.0×10^{13}.

5,815,778

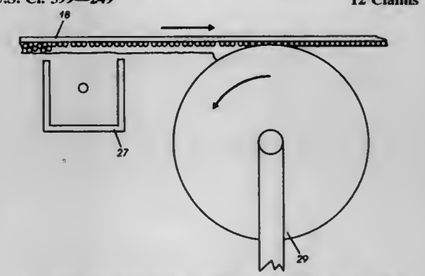
Patent Not Issued For This Number

5,815,779

SYSTEM FOR CONDITIONING LIQUID INK IN A LIQUID INK TYPE ELECTROSTATOGRAPHIC SYSTEM

Dennis A. Abramsohn, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 17, 1996, Ser. No. 649,345
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—249 **12 Claims**



1. A system for conditioning a liquid ink layer including charged toner particles of a selected charge polarity immersed in a liquid carrier medium delivered to an image bearing surface, comprising:

a first member, including a corona generating device, for applying a charge of the same charge polarity of the charged toner particles to the liquid ink layer to electrostatically compress the toner particles towards the image bearing surface, forming a compressed liquid ink layer thereon; and

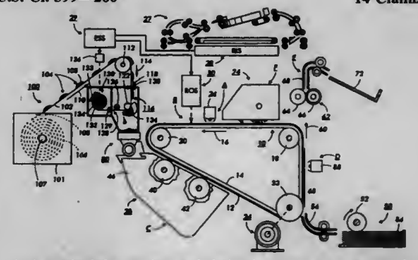
a second member, including a contact member, for contacting the compressed liquid ink layer to remove excess liquid from the compressed liquid ink layer without disturbing the toner particles therein.

5,815,780

METHOD AND APPARATUS FOR STORING AND DELIVERING TONER

Richard H. Boerger, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1996, Ser. No. 772,366
Int. Cl.[6] G03G *15/08*
U.S. Cl. 399—260 **14 Claims**



1. A method for storing and delivering toner to a developing system in a printing device comprising:

storing toner in a first container and a second container, the first and second containers being sealed containers;

connecting the first container and the second container with a connecting member;

placing the first container and the second container in a toner supply housing;

extracting toner from the first and second containers by rupturing the first and second containers;

delivering the extracted toner to the developing system;

moving the first and second containers from the toner supply housing to an extracting housing wherein the toner extracting occurs;

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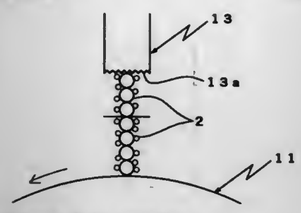
controlling the movement of the first and second containers with a controller based on the amount of toner used by the development system; and

moving the first and second containers to a take up member after the toner extracting, the take up member being controlled by the controller.

5,815,781
DEVELOPMENT DEVICE

Yoshiyuki Iguchi, Takarazuka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Jun. 18, 1997, Ser. No. 877,818
Claims priority, application Japan, Jun. 21, 1996, 8-181254
Int. Cl.[6] G03G *15/09*
U.S. Cl. 399—274 **13 Claims**



1. A development device comprising:

a developer carrier member for transporting a developer to a development region opposite to an image bearing body by binding the developer to the developer carrier member by means of a magnetic force, said developer comprising a toner and a carrier, and

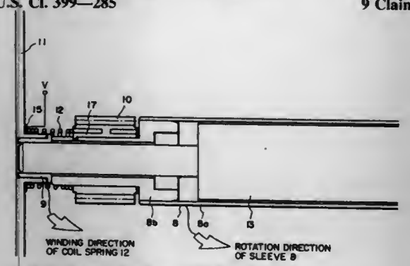
a regulating member opposing the developer carrier member across a required distance therebetween and regulating the amount of developer transported by the developer carrier member to the development region,

said regulating member being formed of a magnetic material and having a greater roughness at a surface opposite to the developer carrier member than the developer carrier member.

5,815,782
DEVELOPING APPARATUS

Kanji Yokomori, Odawara, and Shigeo Miyabe, Numazu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1996, Ser. No. 685,508
Claims priority, application Japan, Jul. 26, 1995, 7-209344
Int. Cl.[6] G03G *15/08*
U.S. Cl. 399—285 **9 Claims**



1. A developing apparatus comprising:

a rotatable developer carrying member for carrying a developer;

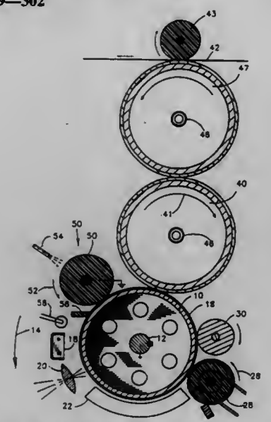
an electrode to be supplied with a bias voltage; and

a coil spring, press-fitted into an end portion of the developer carrying member, for electrical connection between the electrode and the developer carrying member.

5,815,783
METHOD AND APPARATUS FOR PRINTING ON BOTH SIDES OF A SUBSTRATE

Ishaiau Lior, Nez Ziona, Israel; Benzion Landa, Edmonton, Canada; Amiran Lavon, Bat Yam, and Hanna Pinhas, Holon, both of Israel, assignors to Indigo N.V., SM Veldhoven, Netherlands

Continuation of Ser. No. 115,803, Sep. 3, 1993, Pat. No. 5,572,274, which is a continuation of Ser. No. 446,877, Dec. 6, 1989, abandoned. This application Sep. 9, 1996, Ser. No. 711,244
Int. Cl.[6] G03G *15/01;15/16*
U.S. Cl. 399—302 **27 Claims**



1. A method of printing images on two sides of a substrate comprising:

(a) forming a first image on a first surface;

(b transferring the first image to a second surface from the first surface;

(c) forming a second image on the first surface;

(d) transferring the second image to a third surface from the first surface; and

(e) simultaneously transferring the first and second images from the second and third surfaces to the two sides of a substrate,

wherein at least one of the first and second images comprises a multicolor image formed of a plurality of monochrome images and wherein the plurality of monochrome images are formed separately on the first surface and transferred sequentially to the third surface.

5,815,784
CLEANING DEVICE FOR AN IMAGE FORMING APPARATUS AND A TONER COLLECTING DEVICE THEREFOR

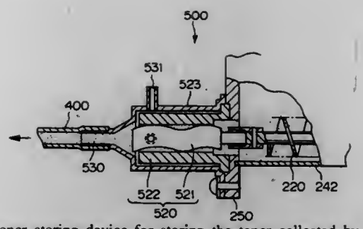
Nobuo Kasahara, Yokohama; Satoshi Muramatsu, and Takashi Hodoshima, both of Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1996, Ser. No. 748,979
Claims priority, application Japan, Nov. 15, 1995, 7-297027; Dec. 26, 1995, 7-339182; Jun. 17, 1996, 8-155739; Nov. 5, 1996, 8-292696
Int. Cl.[6] G03G *21/10*
U.S. Cl. 399—358 **31 Claims**

1. An image forming apparatus comprising:

a cleaning device for removing toner remaining after image formation;

a developing device for developing a latent image electrostatically formed on an image carrier to thereby produce a corresponding toner image;



a toner storing device for storing the toner collected by said cleaning device;

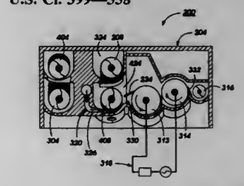
a toner conveying device for conveying the toner collected by said cleaning device to at least one of said developing device and said toner storing device; and

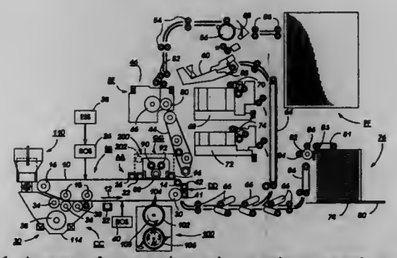
screw pump means included in said toner conveying device, for rotating a rotor to thereby move the toner collected by said cleaning device from said cleaning device in the axial direction of said rotor.

5,815,785
METHOD AND APPARATUS FOR MIXED COLOR TONERS SEPARATION AND RECOVERY

Jan Bares, Webster, and Nero R. Lindblad, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1997, Ser. No. 785,110
Int. Cl.[6] G03G *21/10*
U.S. Cl. 399—358 **12 Claims**





1. Apparatus for separating and recovering separately toner particles of one matchable characteristic different color toner contained in a mixture of a plurality of such different color toners, the apparatus comprising:

(a) holding means for holding a quantity of the mixture of a plurality of such different color toners;

(b) a selected particular type of carrier beads characteristically matching, and being more likely to charge, attract and triboelectrically bind with, toner particles of a matching color toner in the mixture of the different color toners than with toner particles of any other color toner therein;

(c) blending means for forming, in said holding means, an admixture of a quantity of the mixture of the different color toners and a quantity of said selected particular type of carrier beads such that said admixture has a toner coated carrier phase and a loose toner particles phase, and such that the toner coated carrier phase comprises said selected particular type of carrier beads coated with toner particles of the matching color toner of the different color toners of the admixture;

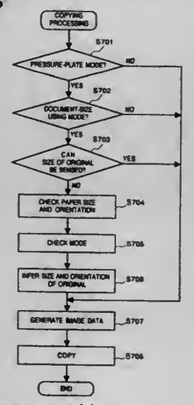
(d) separating means for separating the toner coated carrier phase from the loose toner particles phase; and

(e) recovery means for separating and removing, from the coated selected particular type of carrier beads of the toner coated carrier phase, the toner particles of the matching color toner.

5,815,786
COPIER APPARATUS

Keizo Isemura, Koganei, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1996, Ser. No. 735,398
Claims priority, application Japan, Oct. 24, 1995, 7-275767
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—376 **21 Claims**



1. A copier apparatus comprising:

mode setting means for setting a copying mode in which an image of a document is copied;

paper selection means for selecting a recording paper;

first sensing means for sensing size of the paper selected by said paper selection means;

second sensing means for sensing size of the document; and

inferring means for inferring size of the document based upon the copying mode set by said mode setting means and the size of the paper sensed by said first sensing means if the size of the document cannot be sensed by said second sensing means.

5,815,787
CASSETTE TRAY ASSEMBLY FOR FEEDING SHEETS OF DIFFERENT BASIS WEIGHT

Bruce E. Crayton, Rochester, and Hector J. Sanchez, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 14, 1997, Ser. No. 970,838
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—393 **6 Claims**

1. A sheet stacking and lifting cassette tray assembly for reliably and effectively feeding sheets of different basis weight for use in a reproduction machine, the sheet stacking and lifting cassette tray assembly comprising:

(i) a cassette frame including a frame floor, and frame side walls;

(ii) a plurality of sheet stacking and lifting subassemblies mounted within, and to, said frame side walls for applying selectable values of sheet lifting normal forces against a sheet feedhead, each sheet stacking and lifting subassembly of said plurality of sheet stacking and lifting subassemblies including a pivotable stacking and supporting plate, and a set of springs

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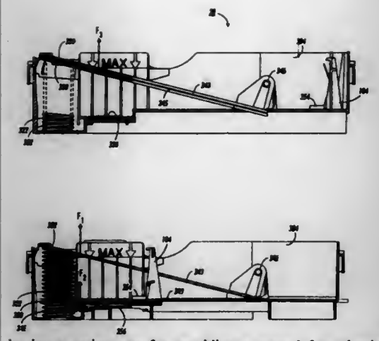


having a spring rate for providing a normal force having a particular value for lifting a stack of sheets; and

(iii) a selecting device for engaging a first number of said plurality of sheet stacking and lifting subassemblies so as to prevent said first number of said plurality of sheet stacking and lifting subassemblies from applying a normal force for lifting thus varying a number of said sheet stacking and lifting subassemblies applying a normal force to a stack of sheets of a given basis weight, and thereby enabling reliable and effective feeding of sheets from such stack without sheet feeding miscues.

5,815,788

PRINTING APPARATUS FOR PRINTING TONER POWDER IMAGES ON BOTH SIDES OF AN IMAGE RECEIVING SUPPORT

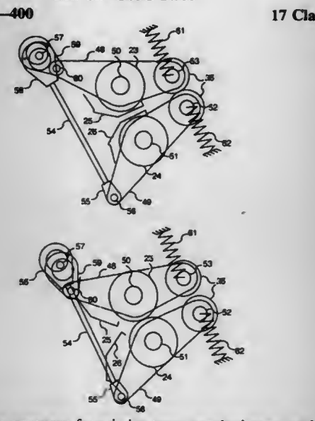
Hubertus W. G. In't Zandt, Byronstraat 55, 5924 XL Venlo, Netherlands

Filed Jul. 25, 1997, Ser. No. 900,837

Claims priority, application Netherlands, Jul. 25, 1996, 1003679

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—400 **17 Claims**



1. A printing apparatus for printing toner powder images on both sides of an image receiving support comprising:

an image recording medium for forming a toner powder image thereon;

transfer means for transferring a toner powder image from the image recording medium to the image receiving support;

fixing means for fixing a transferred toner powder image on the image receiving support by means of pressure surfaces coming into contact with both sides of the image receiving support;

image receiving support transport means for transporting an image receiving support provided with a toner powder image on a first side back to the transfer means for transferring a toner powder image to a second side of the image receiving support;

adjustable image receiving support transport means for transporting the image receiving support by means of transport surfaces coming into contact with the image receiving support, wherein the adjustable image receiving support transport means, as considered in the image receiving support transport direction, are disposed immediately after the fixing means; and

shifting means for adjusting the fixing means and the adjustable image receiving support transport means to a first and second mode, wherein in the first mode the adjustable image receiving support transport means are operative and transport the image receiving support wherein the transport surfaces come into contact with the image receiving support and the fixing means are inoperative and the pressure surfaces thereof do not come into contact with the image receiving support, in the second mode the fixing means are operative and fix and transport the image receiving support wherein the pressure surfaces come into contact with the image receiving support and the adjustable image receiving support transport means are inoperative and the transport surfaces thereof do not come into contact with the image receiving support, the shifting means adjusts the first and the second modes respectively on the first and second pass respectively of the image receiving support to be fixed on two sides by the fixing means.

5,815,789

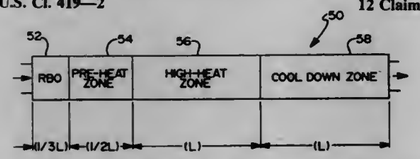
METHOD FOR PRODUCING SELF LUBRICATING POWDER METAL CYLINDER BORE LINERS

Edward Akpan, Novi, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 8, 1996, Ser. No. 676,760

Int. Cl.[6] B22F *3/26;5/00*

U.S. Cl. 419—2 **12 Claims**



1. A method for producing self lubricating powder metal cylinder bore liners for an internal combustion engine, said method comprising the steps of:

loading a powder metal mixture into a die cavity;

compacting the powder metal mixture in the die cavity and forming a powder metal cylinder bore liner with a porous structure;

sintering the powder metal cylinder bore liner; and

impregnating the porous structure of the powder metal cylinder bore liner with a liquid lubricant to provide self lubricating properties.

5,815,790

METHOD RELATING TO THE MANUFACTURING OF A COMPOSITE METAL PRODUCT

Per Billgren, Söderfors, and Kaj Embretsen, Edsbyn, both of Sweden, assignors to Soderfors Powder Aktiebolag, Soderfors, Sweden

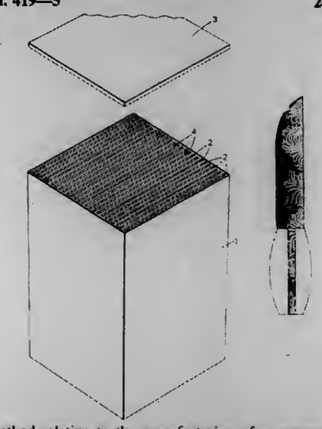
PCT No. PCT/SE95/00020, § 371 Date Dec. 4, 1996, § 102(e) Date Dec. 4, 1996, PCT Pub. No. WO95/19861, PCT Pub. Date Jul. 27, 1995

PCT Filed Jan. 12, 1995, Ser. No. 676,261

Claims priority, application Sweden, Jan. 19, 1994, 9400127

Int. Cl.[6] B22F *7/04*

U.S. Cl. 419—5 **20 Claims**



1. Method relating to the manufacturing of a composite metal product comprising at least two stainless steel materials having different chemical compositions, which are bonded to each other through compaction treatment at a pressure exceeding 600 bar and a temperature exceeding 1000° C., at least one of said at least two stainless steel materials prior to said compaction consisting of a powder, wherein said at least two stainless steel materials are arranged in a capsule, the air is evacuated from the capsule, and the capsule thereafter is closed and subjected to said compaction treatment for the achievement of a consolidated body, said at least two stainless steel materials being arranged alternatingly in a plurality of layers in said capsule prior to said compaction treatment, and wherein said at least two stainless steel materials include a first and a second stainless steel, which first and second stainless steels have different compositions, one of the first and second stainless steels further colored through etching substantially more than the other of the first and second stainless steels.

5,815,791

STRUCTURAL ELEMENT WITH BRAZED-ON FOIL MADE OF OXIDE DISPERSION-STRENGTHENED SINTERED IRON ALLOY AND PROCESS FOR THE MANUFACTURE THEREOF

Dieter Sporer, Tannheim, Austria, assignor to Schwarzkopf Technologies Corporation, New York, N.Y.

Filed Mar. 20, 1996, Ser. No. 618,828

Claims priority, application Germany, Mar. 25, 1995, 195 11 089.7

Int. Cl.[6] B22F *7/04*

U.S. Cl. 419—8 **8 Claims**

1. A process for manufacturing a structural element with brazed-on, bent or folded metal foil components having a foil thickness of less than 500 μm, made of an ODS sintered ferrous material, said process comprising the steps of manufacturing the sintered foil material by mechanically alloying basic powders, hot pressing and extruding or hot pressing or extruding, and subsequently hot-rolling, cold-rolling and final recrystallization annealing to form the foil having improved mechanical strength properties, wherein said process further comprises the steps of annealing the foil after said cold-rolling step, subsequently bending or folding the foil at room temperature, and recrystallization-annealing the foil in a single process step, simultaneously with a brazing operation, at a temperature between 1100° and 1330° C. during 3–600 minutes.

5,815,792

NICKEL-BASED SUPERALLOYS WITH HIGH TEMPERATURE STABILITY

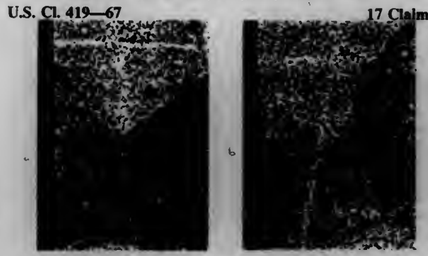
Catherine DuQuenne, Paris; Jean Charles Henri Lautridou, Bondoufle; Michel Marty, Buc; Michéle Soucail, Fontenay Aux Roses, and André Walder, L'Hay Les Roses, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma", Paris, France

Filed Jul. 30, 1996, Ser. No. 689,157

Claims priority, application France, Aug. 9, 1995, 95 09653

Int. Cl.[6] B22F *1/00;5/00;5/04;* **C22C** *19/05*

U.S. Cl. 419—67 **17 Claims**



1. A nickel-based superalloy consisting essentially of, in percentages by weight:

Co 14.5 to 15.5%

Cr 12 to 15%

Mo 2 to 4.6%

W 0 to 4.5%

Al 2.5 to 4%

Ti 4to 6%

Hf not more than 0.5%

C 100 to 300 ppm

B 100 to 500 ppm

Zr 200 to 700 ppm

Ni as the balance,

wherein the sum of the atomic concentrations of gamma-prime-gene elements (Al+Ti+Hf) is $11.5\% \leqq (Al+Ti+Hf) \leqq 14.5\%$, the sum of the atomic concentrations of gamma-gene elements (Mo+W+Cr) in the alloy is $14.5\% \leqq (Mo+W+Cr) \leqq 19\%$, and a computed value for the stability criterion Md is $0.900 \leqq Md \leqq 0.915$, and wherein the microstructure of said alloy does not evolve substantially during an aging treatment at 750° C. for 500 hours.

12. A method of making the nickel-based superalloy of claim 1, comprising:

pulverization;

extrusion;

a first stage of solution heat treatment above the gamma-prime solvus;

a second stage of solution heat treatment at a temperature 20°–25° C. lower than the temperature of said first stage of solution beat treatment; and

ageing.

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5,815,793

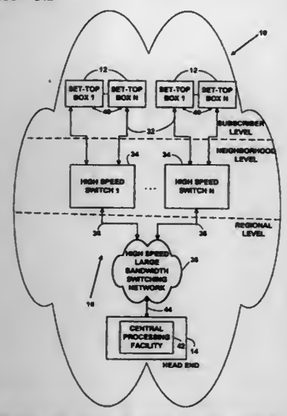
PARALLEL COMPUTER

Robert Ferguson, Seattle, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Oct. 5, 1995, Ser. No. 539,399

Int. Cl.[6] H04N *7/16;7/173*

U.S. Cl. 455—3.1 **37 Claims**



1. In a parallel processor including a control station coupled to a plurality of processing nodes, the control station serving to partition a processing task and distribute partitioned subtasks thereof to the processing nodes for processing, the control station further serving to collect processed results from said nodes and use said results to produce a final output to said processing task, an improvement comprising an asymmetrical network coupling each of the processing nodes to the control station, said network providing a first bandwidth link for coupling data from the control station to the processing nodes, and a second bandwidth link for coupling data from the processing nodes back to the control station, said first bandwidth being at least twice the second bandwidth, wherein the network resources are efficiently allocated to handle processing tasks that can be partitioned into subtasks which have more input data than output data.

5,815,794

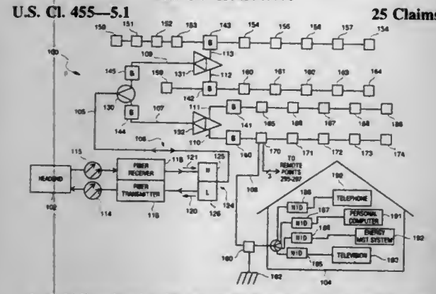
UNDESIRABLE ENERGY SUPPRESSION SYSTEM IN THE RETURN PATH OF A BIDIRECTIONAL CABLE NETWORK HAVING DYNAMICALLY ALLOCATED TIME SLOTS

Thomas H. Williams, Longmont, Colo., assignor to Cable Television Laboratories, Inc., Louisville, Colo.

Filed Sep. 1, 1995, Ser. No. 522,630

Int. Cl.[6] H04N *7/173*

U.S. Cl. 455—5.1 **25 Claims**



1. A bidirectional cable network system for enabling bidirectional signal exchanges in a network having a bidirectional communication path between a headend signal source and a plurality of remote points, said system comprising:

first means for enabling said plurality of remote points to receive a first signal transmitted in a first direction over said bidirectional communication path from said headend to said plurality of remote points;

means for defining a series of cyclically reoccurring time slots for use on said bidirectional communication path between said headend and said plurality of remote points;

at least one return gate located in a second direction of said bidirectional communication path to connect and disconnect said second direction of said bidirectional communication path in concert with any one of said series of cyclically reoccurring time slots on behalf of any of said plurality of remote points that are downstream from said at least one return gate;

means for requesting an assignment of at least one of said series of cyclically reoccurring time slots at will by any of said plurality of remote points;

means for dynamically assigning at least one of said series of cyclically reoccurring time slots in real time to said requesting one of said plurality of remote points;

second means for enabling said requesting one of said plurality of remote points to transmit in said second direction to said headend during an occurrence of each of said at least one of said series of cyclically reoccurring time slots to which said requesting one of said plurality of remote points is assigned; and

means for engaging each of said at least one return gate independent of said headend to disconnect said second direction of said bidirectional communication path by way of each of said at least one return gate at all times except to connect said second direction of said bidirectional communication path by each of said at least one return gate that is in an upstream path from said requesting one of said plurality of remote points during an occurrence of each of said series of cyclically reoccurring time slots to which said requesting one of said plurality of remote points is assigned.

5,815,795

OSCILLATION DETECTING SYSTEM FOR WIRELESS REPEATER

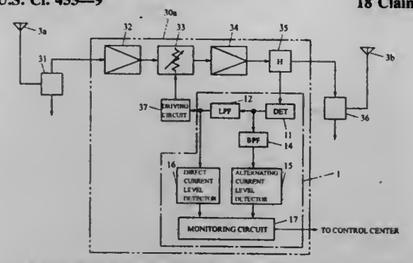
Tohru Iwai, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1996, Ser. No. 686,034

Claims priority, application Japan, Aug. 25, 1995, 7-217141; Dec. 27, 1995, 7-341602

Int. Cl.[6] H04B *1/60*

U.S. Cl. 455—9 **18 Claims**



1. An oscillation detecting apparatus for detecting an oscillation of a wireless repeater intervening between a base station and a mobile station brought in communication with each other through a time division multiple access system, said wireless repeater being operated to produce an input signal based on a radio wave transmitted from one of said base station and said mobile station, and amplify said input signal to produce an output signal, said wireless repeater being further operated to transmit said output signal in the form of a radio wave to the other of said base station and said mobile station, and said oscillation detecting apparatus comprising:

producing means for producing a power level signal varied in proportion with an amplitude of said output signal;

first detecting means for detecting a direct current component included in said power level signal;

second detecting means for detecting an alternating current component included in said power level signal;

first judging means for judging whether said direct current component of said power level signal has reached a predetermined upper-limiting level or not;

second judging means for judging whether said alternating current component of said power level signal is smaller than a predetermined criterion level or not; and

deciding means for deciding that said wireless repeater is oscillating when said first judging means judges that said direct current component of said power level signal has reached said predetermined upper-limiting level, and when said second judging means judges that said alternating current component of said power level signal is smaller than said predetermined criterion level.

5,815,796

METHOD FOR DETERMINING PARAMETERS FOR THE DESIGN OF GROUND EQUIPMENT FOR A SATELLITE LINK SYSTEM AND A METHOD OF TRANSMITTING SIGNALS IN A SATELLITE LINK SYSTEM

Robert Athol Armstrong, Berowra, and John Joseph Phillips, Matraville, both of Australia, assignors to Spatial Communications Pty. Ltd., Australia

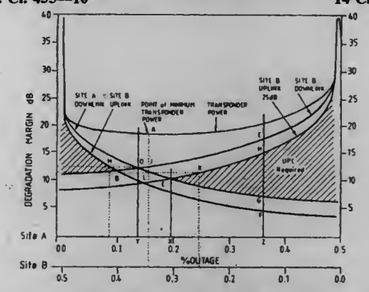
PCT No. PCT/AU93/00339, § 371 Date Jan. 4, 1995, § 102(e) Date Jan. 4, 1995, PCT Pub. No. WO94/01940, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 9, 1993, Ser. No. 373,286

Claims priority, application Australia, Jul. 9, 1992, PL3413

Int. Cl.[6] H04B *1/60*

U.S. Cl. 455—10 **14 Claims**



1. A method of determining parameters for the design of ground equipment for a satellite link system utilising duplex links comprising:

selecting a required availability of the satellite system;

choosing at least first and second ground sites for ground equipment;

determining site degradation parameters for the ground sites;

determining an operating range where no uplink power control is required; and

determining a point of minimum transponder power;

such that parameters of the ground equipment required to transmit the duplex signal can be selected for the design of the ground equipment.

5,815,797

Patent Not Issued For This Number

5,815,798

APPARATUS AND METHOD OF CONTROLLING TRANSMITTING POWER IN A SUBSCRIBER TERMINAL OF A WIRELESS TELECOMMUNICATIONS SYSTEM

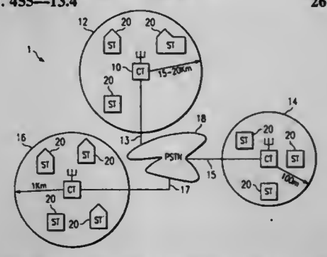
Shashikant Bhagalia, Edmonton, and Joemanne Chi Cheung Yeung, Wellingborough, both of United Kingdom, assignors to DSC Communications Corporation, Plano, Tex.

Filed Nov. 16, 1995, Ser. No. 558,738

Claims priority, application United Kingdom, Jun. 2, 1995, 9510870; Jun. 7, 1995, 9511546

Int. Cl.[6] H04B *7/185*

U.S. Cl. 455—13.4 **26 Claims**



1. A method of controlling transmitter power in a subscriber terminal from a central terminal in a wireless telecommunications system, comprising the steps of:

establishing a downlink communication path from a transmitter of the central terminal to a receiver of the subscriber terminal;

transmitting a downlink signal from the transmitter of the central terminal, the downlink signal having a traffic carrying channel, the downlink signal having an overhead channel to transfer control information separate from the traffic carrying channel, the overhead channel including a power control signal;

extracting the power control signal from the overhead channel of the downlink signal at the receiver of the subscriber terminal;

adjusting a transmitting power of a transmitter in the subscriber terminal in response to a value of the power control signal in order to establish an uplink communication path between the transmitter in the subscriber terminal and a receiver in the central terminal.

5,815,799

PRIORITY SYSTEM FOR A WIDE AREA TRANSMISSION TRUNKED COMMUNICATION SYSTEM

Keith W. Barnes; Donald R. Bauman; Howard N. Brace; Philip A. Keefer, and Michael E. Mihelich, all of Waseca, Minn., assignors to E.F. Johnson Company, Burnsville, Minn.

Continuation of Ser. No. 400,854, Mar. 8, 1995, abandoned, which is a continuation of Ser. No. 903,050, Jun. 23, 1992, abandoned, which is a continuation of Ser. No. 716,757, Jun. 18, 1991, Pat. No. 5,159,701, which is a continuation of Ser. No. 332,675, Mar. 31, 1989, abandoned. This application Aug. 7, 1996, Ser. No. 693,557

Int. Cl.[6] H04B *7/14*

U.S. Cl. 455—15 **16 Claims**

1. A method for channel selection for a land mobile transmission trunked communication system having a plurality of transceivers for transmitting and receiving distributively selected transmission trunked radio communications over one or more radio channels, comprising the steps of:

assigning a priority to each transmitter of the plurality of transceivers, including one or more highest priority transceivers and one or more lowest priority transceivers;

if only one radio channel is free, performing the steps of:

allowing access only to the one or more highest priority transceivers for a first time interval;

if the one radio channel remains free, allowing access to a next lower priority transceiver for a second time interval; and

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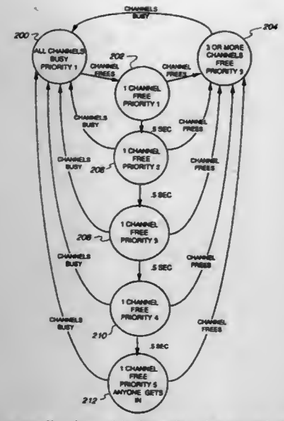


if the one radio channel is free after the second time interval, repeating the previous step until the next lower priority transceiver is a lowest priority transceiver or until the one radio channel is no longer free; and

if no radio channel is free, allowing access only to the highest priority transceivers.

5,815,800

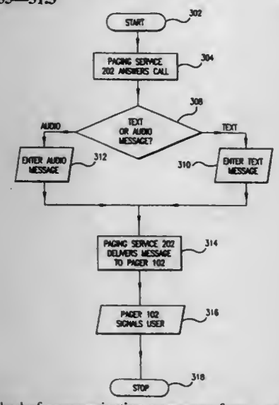
VOICE-PAGER SYSTEM

Lily Su, and Sulton Su, both of Plano, Tex., assignors to MCI Communication Corporation

Filed Jun. 24, 1996, Ser. No. 669,191

Int. Cl.[6] H04Q *7/10;7/12*

U.S. Cl. 455—31.3 **18 Claims**



1. A method of communicating a message from a paging service to a pager, the pager operable to receive and transmit both audio and text messages, comprising the steps of:

enabling an operator of the pager to select a preferred message format, wherein said preferred message format is one of audio and text;

establishing contact between a message originator and the paging service;

enabling said message originator to select a message format for the message, wherein said first message format is one of audio and text;

enabling said message originator to enter the message in said first message format;

converting the message from said first message format to said preferred message format if said preferred message format differs from said first message format; and

delivering the message in said preferred message format from the paging service to the pager.

5,815,801

METHOD FOR ESTIMATING THE QUALITY OF A CONNECTION, AND A RECEIVER

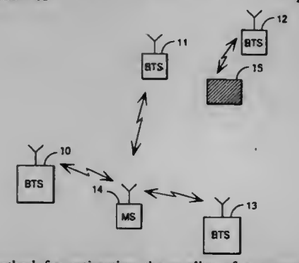
Seppo Hämäläinen, Espoo, and Jere Keurulainen, Helsinki, both of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed May 15, 1996, Ser. No. 645,023

Claims priority, application Finland, May 17, 1995, 952397

Int. Cl.[6] H04B *15/02*

U.S. Cl. 455—63 **20 Claims**



1. A method for estimating the quality of a connection in a receiver of a subscriber terminal equipment in a CDMA cellular radio system having a plurality of base stations, the estimating being accomplished when each of said base stations is transmitting a pilot signal, wherein interference caused by transmissions of one or more of said base stations is estimated by comparing the strengths of the pilot signals transmitted by individual ones of said base stations with the strength of a received broadband signal within a given measurement period, said received broadband signal comprising a plurality of data signals wherein each of said data signals is modulated by a spectral spreading code enlarging a bandwidth of the data signal.

5,815,802

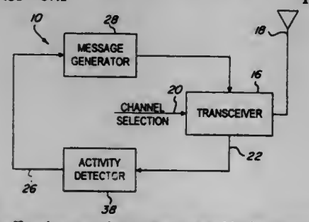
TRAFFIC ALERT WARNING SYSTEM AND METHOD FOR ALERTING VEHICLE OPERATORS OF ROAD CONDITIONS

Henry A. Loechner, II, Waterbury, Conn., assignor to Highway Technologies, Inc., Westport, Conn.

Filed Jul. 16, 1996, Ser. No. 680,633

Int. Cl.[6] H04B *17/00;* **G08G** *1/09*

U.S. Cl. 455—67.1 **19 Claims**



1. A traffic alert warning system operable in communication channels operating at different frequencies, comprising:

a storage unit for storing a road condition message;

means for monitoring a first of the communication channels and producing first channel signals indicative thereof;

means responsive to the first channel signals for generating an activity level signal representative of the communication activity of the first communication channel;

means for generating a first reference activity signal indicative of the activity level of the first channel over a predetermined time period;

means for deriving an availability signal indicative of the availability of the first communication channel for transmitting the road condition message; and

means responsive to the availability signal for enabling transmission of the road condition message in the storage unit.

5,815,803

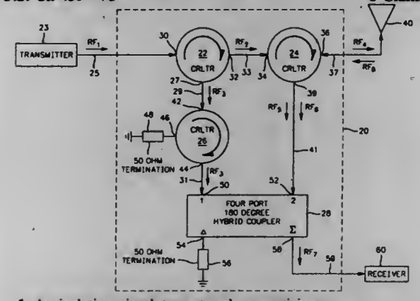
WIDEBAND HIGH ISOLATION CIRCULATIOR NETWORK

Thinh Q. Ho, Anaheim; Stephen M. Hart, San Diego; Gregory A. Kosinovsky, San Diego, and Willard I. Henry, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 8, 1996, Ser. No. 614,782

Int. Cl.[6] H04B *1/44*

U.S. Cl. 455—78 **8 Claims**



1. An isolation circulator network, comprising:

a first circulator for transforming a first RF signal, RF_1, into a second RF signal, RF_2 and a third RF signal, RF_3;

a second circulator for throughputting said third RF signal;

a third circulator for transforming said second RF signal into a fourth RF signal, RF_4, and a fifth RF signal, RF_5, and for through putting a sixth RF signal, RF_6;

a 180-degree hybrid coupler which provides a seventh RF signal, RF_7 in response to receiving said third, fifth, and sixth RF signals, where $RF_7=(RF_5-RF_3+RF_6)$.

5,815,804

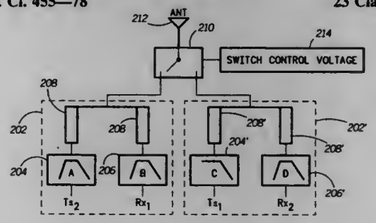
DUAL-BAND FILTER NETWORK

Michael A. Newell, Placitas; Reddy Ramachandra Vangala, Albuquerque, both of N. Mex., and Constantine Vlahos, Mundelein, Ill., assignors to Motorola, Schaumburg, Ill.

Filed Apr. 17, 1997, Ser. No. 843,905

Int. Cl.[6] H04B *1/44*

U.S. Cl. 455—78 **23 Claims**



1. A radio communication apparatus, comprising:

an antenna for receiving and transmitting signals from a first frequency band and a second frequency band;

a first duplex pair including a first transmit filter including a first passband in the second frequency band and a first stopband in the first frequency band and a second receive filter including a second passband in the first frequency band and a second stopband in the second frequency band;

the first filter presenting a consistent phase in the second passband and the second filter presenting a consistent phase in the first passband due to a wide frequency separation between the first filter and the second filter;

the first duplex pair having a lower insertion loss at an inside passband edge of the first passband and the second passband;

a second duplex pair including a third transmit filter including a third passband in the first frequency band and a third stopband in the second frequency band and a fourth receive filter including a fourth passband in the second frequency band and a fourth stopband in the first frequency band;

the third filter presenting a consistent phase in the fourth passband and the fourth filter presenting a consistent phase in the third passband due to a wide frequency separation between the third filter and the fourth filter;

the second duplex pair having a lower insertion loss at an inside passband edge of the third passband and the fourth passband; and

a switching means capable of operating in a first condition and a second condition for, in the first condition, connecting the antenna to the first duplex pair only, and, in the second condition, connecting the antenna to the second duplex pair only, the switching means controlled by a switch control voltage.

5,815,805

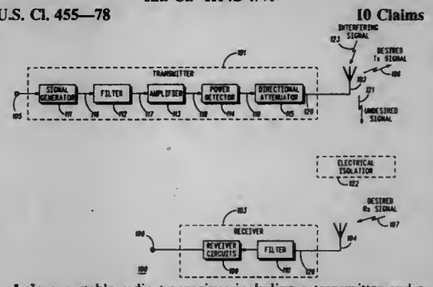
APPARATUS AND METHOD FOR ATTENUATING AN UNDESIRED SIGNAL IN A RADIO TRANSCEIVER

James John Crnkovic, Lake Zurich, and Jin Dong Kim, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 386,601, Feb. 10, 1995, abandoned, which is a continuation of Ser. No. 102,931, Aug. 6, 1993, abandoned. This application Jun. 23, 1997, Ser. No. 880,316

Int. Cl.[6] H04B *1/40*

U.S. Cl. 455—78 **10 Claims**



1. In a portable radio transceiver including a transmitter and a receiver operating at different respective frequencies, wherein the transmitter includes an amplifier having input and output terminals, and wherein the transmitter produces an undesired intermodulation signal at a frequency within the receiver's operating frequency, an apparatus for attenuating the undesired intermodulation signal comprising:

a first antenna coupled to the transmitter and adapted to receive an interfering signal having a frequency that combines with a signal substantially equal to the transmitter operating frequency in the amplifier to produce the undesired intermodulation signal;

a second antenna coupled to the receiver and configured to be electrically isolated from the first antenna by a predetermined

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degree to attenuate the undesired intermodulation signal received by the second antenna; and

a directional attenuator coupled between the output terminal of the amplifier and the first antenna, wherein the directional attenuator is adapted to attenuate the interfering signal received by the first antenna to further attenuate the undesired intermodulation signal received by the second antenna.

5,815,806

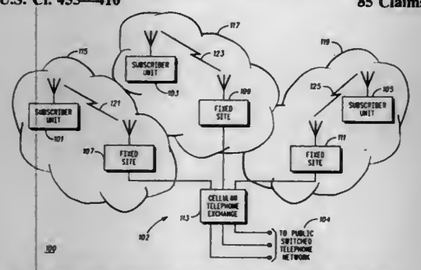
Patent Not Issued For This Number

5,815,807

DISPOSABLE WIRELESS COMMUNICATION DEVICE ADAPTED TO PREVENT FRAUD

Rashid Masood Osmani, Mundelein, and Michael P. Metroka, Algonquin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1996, Ser. No. 594,978
Int. Cl.[6] H04Q *7/32;* **H04M** *9/00*
U.S. Cl. 455—410 **85 Claims**



1. A disposable wireless communication device comprising:

a storage unit having stored therein a predetermined measure of a communication resource;

communication circuitry operatively coupled to the storage unit and permitted to operate for a predetermined period of time responsive to the predetermined measure of the communication resource; and

a controller operatively coupled to the storage unit and the communication circuitry and adapted for:

monitoring a rate of depletion of the communication resource over time, wherein the rate is represented by a desireable rate or an undesireable rate;

permitting operation of the communication circuitry when the communication resource is being depleted at the desirable rate, thereby decreasing the predetermined period of time that the communication circuitry is permitted to operate; and

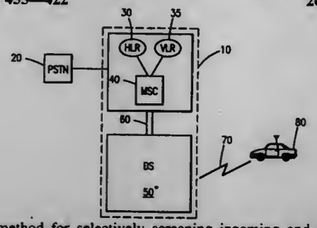
preventing operation of the communication circuitry when the communication resource is being depleted at the undesirable rate, thereby prolonging the predetermined period of time that the communication circuitry is permitted to operate.

5,815,808

LOCATION BASED SCREENING IN A MOBILE TELECOMMUNICATIONS SYSTEM

Eric Lee Valentine, Plano, Tex., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Feb. 20, 1996, Ser. No. 604,097
Int. Cl.[6] H04Q *7/24;* **H04M** *1/64*
U.S. Cl. 455—422 **26 Claims**



1. A method for selectively screening incoming and outgoing calls for a mobile subscriber within a cellular telecommunications system, said method comprising the steps of:

receiving a call setup request to establish a connection between said mobile subscriber and a telecommunications party, said telecommunications party having an associated directory number;

determining a current location of said mobile subscriber;

determining whether said directory number is an entry within an individualized screening list associated with said current location for said mobile subscriber; and

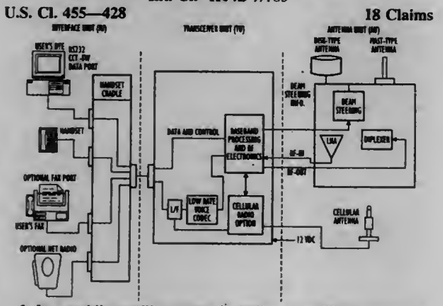
processing said call setup request in response to said step of determining.

5,815,809

MOBILE EARTH TERMINAL COMMUNICATION DEVICE PROVIDING VOICE, DATA, FACSIMILE, AND/OR ROAMING COMMUNICATION FEATURES

Michael K. Ward; Gary G. Churan; William R. Tisdale, and David J. Ross, all of Reston, Va., assignors to AMSC Subsidiary Corporation, Reston, Va.

Filed Apr. 16, 1996, Ser. No. 634,305
Int. Cl.[6] H04B *7/185*
U.S. Cl. 455—428 **18 Claims**



1. In a mobile satellite system including a satellite communication switching office having a satellite antenna for receiving/transmitting a satellite message via a satellite from/to a vehicle using a mobile communication system, a satellite interface system, a central controller receiving/transmitting the satellite message from/to the satellite communication switching office issued from the vehicle via the satellite and the satellite interface system, the mobile communication system comprising:

a user interface system providing a user interface through which a user has access to services supported by the mobile satellite system;

an antenna system providing an interface between the mobile communication system and the mobile satellite system via the satellite interface system, and receiving a first satellite message from the satellite and transmitting a second satellite message to the satellite, said antenna system including

an antenna including one of a directional and an omnidirectional configuration, a diplexer, a low noise amplifier, a beam steering unit when said antenna is of the directional configuration, and at least one of a compass and sensor to determine vehicle orientation,

a transceiver system, operatively connected to said antenna system, including a receiver and a transmitter,

the transmitter converting the second satellite message including at least one of voice, data, fax and signaling signals into a modulated signal, transmitting the modulated signal to said antenna system, the transmitter including an amplifier, a first converter and associated first frequency synthesizer, a modulator, an encoder, multiplexer, scrambler and frame formatter for at least one of voice, fax, and data,

the receiver accepting the first satellite message from the antenna system and converting the first satellite message into at least one of voice, data, fax and signaling signals, at least one of the voice, data and fax signals routed to the user interface system, the receiver including a second converter with an associated second frequency synthesizer, a demodulator, a decoder, demultiplexer, descrambler and frame unformatter for at least one of voice, fax, and data;

a logic and signaling system, operatively connected to said transceiver, controlling initialization of the mobile communication system, obtaining an assigned outbound signaling channel from which updated system information and commands and messages are received, said logic and signaling system configuring said transceiver for reception and transmission of at least one of voice, data, fax and signaling messages, and controlling protocols between the mobile communication system and the mobile satellite system, and validating a received signaling messages and generating codes for a signaling message to be transmitted,

said logic and signaling system providing a roam function permitting the mobile communication system to roam between the mobile satellite system and a terrestrial based communication system responsive to the user selection of a primary service and an alternate service, wherein upon the loss of the primary service the mobile communication system waits for a first time interval before attempting to register in the alternate service and when the primary service is recovered prior to the expiration of the first time interval, the mobile communication system will not attempt to register with the alternate service,

wherein when the mobile communication system registers on the alternate service, the mobile communication system will wait a second time interval and continuously monitor the availability of the primary service, and when the primary service becomes satisfactorily available, the mobile communication system will attempt to return the registration to the primary service,

wherein when the primary service is subsequently lost a second time, the mobile communication system will wait a third time interval before attempting to register in the alternate service, and when the primary service is recovered prior to the expiration of the third time interval, the mobile communication system will not attempt registration in the alternate service,

wherein when the mobile communication system registers on the alternate service after the primary service is subsequently lost two times, the mobile communication system waits a fourth time interval and continuously monitors the availability of the primary service and when the primary service becomes satisfactorily available, the mobile communication system will attempt to return the registration to the primary service,

wherein when the primary service is subsequently lost a three or more times, the mobile communication system will wait a fifth time interval before attempting to register in the alternate service, and when the primary service is recovered prior to the expiration of the fifth time interval, the mobile communication system will not attempt registration in the alternate service,

wherein when the mobile communication system registers on the alternate service after the primary service is subsequently lost three or more times, the mobile communication system waits a sixth time interval and continuously monitors the availability of the primary service and when the primary service becomes satisfactorily available, the mobile communication system will attempt to return the registration to the primary service,

wherein when the mobile communication system has invoked any reregistration, a timer will be started for a seventh time interval, the timer being reset for each reregistration, and when the seventh time interval expires, the reregistration delay will be set to the first time interval, and when both the primary and alternate services are lost, the mobile communication system continuously monitors the primary and alternate services, and attempts to register on whichever of the primary and alternate services that is satisfactorily available first; and

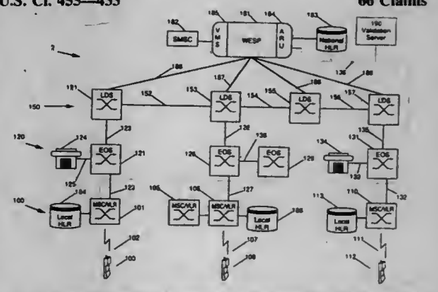
power supply means for providing power to the mobile communication system.

5,815,810

METHOD AND APPARATUS FOR IMPROVED CALL CONNECTIVITY IN AN INTELLIGENT WIRELESS NETWORK

John Gallant; Steven R. Donovan, both of Plano; Anousheh Raissyan, Dallas, and Jeremy Chiou, Plano, all of Tex., assignors to MCI Communications Corporation, Washington, D.C.

Division of Ser. No. 495,997, Jun. 28, 1995, abandoned. This application Aug. 13, 1997, Ser. No. 910,148
Int. Cl.[6] H04Q *7/38*
U.S. Cl. 455—433 **66 Claims**



1. In a mobile radio communications network having multiple network switches and a plurality of mobile switching center/visitor location registers, a system for completing calls to mobile stations, comprising:

a wireless enhanced services platform coupled to at least one network switch of an incoming call to a mobile station, said platform including a controller and switching means for routing calls in response to commands from said controller, said platform adaptable to interface with long distance switches or directly with each of said plurality of mobile switching center/visitor location registers; and

a national home location register, coupled to said platform, for storing a plurality of data records including features relating to said mobile stations, said national home location register interactively working with said platform;

wherein, in receipt of the call number of said incoming call to said mobile station, said platform routes said call number to the mobile switching center/visitor location register where

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said mobile station is located, said mobile switching center/visitor location register, in response, sending routing information relating to the destination of said mobile station to said national home register; and

wherein, in receipt of said routing information, said national location register sends a message containing said routing information and any feature relating to said mobile station to said platform, said platform routing said message to said at least one network switch, said at least one network switch utilizing said routing information to route said call to said mobile station.

5,815,811

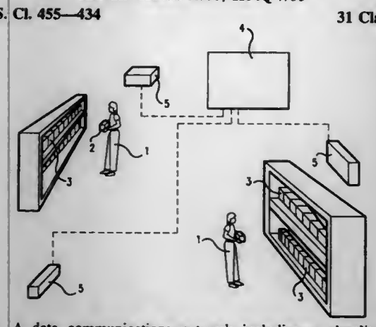
PREEMPTIVE ROAMING IN A CELLULAR LOCAL AREA WIRELESS NETWORK

Patrick Pinard, Santa Clara, and Frederic Heiman, Los Gatos, both of Calif., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation-in-part of Ser. No. 44,648, Apr. 8, 1993, Pat. No. 5,528,621, which is a continuation-in-part of Ser. No. 799,172, Nov. 27, 1991, Pat. No. 5,280,498, which is a continuation-in-part of Ser. No. 635,859, Dec. 28, 1990, Pat. No. 5,142,550, which is a continuation-in-part of Ser. No. 374,452, Jun. 29, 1989, Pat. No. 5,029,183. This application Oct. 27, 1995, Ser. No. 549,051

Int. Cl.[6] H04M *11/00;* **H04Q** *7/00*

U.S. Cl. 455—434 **31 Claims**



1. A data communications network including a plurality of stationary access points operatively connected to a host and a plurality of mobile units, said network comprising:

a) each of the mobile units using frequency hopping spread spectrum radio frequency communications, and including a transmitter for broadcasting a probe packet to all of the access points in a predetermined range from one of the mobile units that is broadcasting the probe packet,

b) said access points within said range including respective receivers for detecting the probe packet being broadcast, and for responsively sending probe response packets back to said one of the mobile units, and

c) a selector in each of the mobile units to select a most eligible one of the access points from said probe response packets, and to associate said one of the mobile units with the most eligible one of the access points at predetermined intervals, the most eligible one of the access points being selected according to received signal quality at said one of the mobile units, and a loading factor at each of the stationary access points.

5,815,812

SOFT HANDOFF SYSTEM OF SPREAD SPECTRUM COMMUNICATION

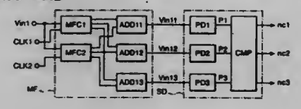
Changming Zhou; Guoliang Shou; Makoto Yamamoto, all of Tokyo; Mamoru Sawahashi; Fumiyuki Adachi, both of Yokohama, and Sunao Takatori, Tokyo, all of Japan, assignors to NTT Mobile Communications Network, Inc., and Yozan, Inc., both of Tokyo, Japan

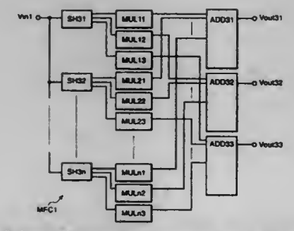
Filed Dec. 5, 1996, Ser. No. 760,257

Claims priority, application Japan, Dec. 6, 1995, 7-344878

Int. Cl.[6] H04Q *7/32*

U.S. Cl. 455—442 **8 Claims**





1. A soft handoff system for changing one or more cell-site stations connected to a mobile system among a plurality of cell-site stations around said mobile system by measuring signal strengths from said cell-site stations around said mobile system so that said cell-site stations currently connected are not disconnected until said new cell-site stations are connected, comprising:

(A) a plurality of matched filters corresponding to said cell-site stations around said mobile system, comprising:

a) a plurality of sampling and holding circuits having,

i) a switch connected to an input voltage representing the signals received by its respective cell site station,

ii) a first capacitance connected to an output of said switch,

iii) a first inverted amplifying portion with odd number of stages of MOS inverters connected to an output of said first capacitance,

iv) a first feedback capacitance for connecting an output of said first inverted amplifying portion to its input,

v) a first multiplexer for alternatively outputting an output of said first inverted amplifying portion or a reference voltage, and

vi) a second multiplexer for alternatively outputting said output of said first inverted amplifying portion or said reference voltage by an inverse alternation of said first multiplexer,

b) a first addition circuit having,

i) a plurality of second capacitances each connected with one of outputs of said first multiplexer of each said sampling and holding circuit,

ii) a second inverted amplifying portion with odd number of stages of MOS inverters to which outputs of said second capacitances are commonly connected, and

iii) a second feedback capacitance for connecting an output of said second inverted amplifying portion to its input;

c) a second addition portion having,

i) a plurality of third capacitances each connected with one of outputs of said second multiplexer and first addition portion of each sampling and holding circuit,

ii) a third inverted amplifying portion with odd number of stages of MOS inverters to which outputs of said third capacitances are commonly connected, and

iii) a third feedback capacitance for connecting an output of said third inverted amplifying portion to its input;

d) a subtracting portion for subtracting an output of said second addition portion from said first addition portion,

e) a controlling circuit for closing said switch of one of said sampling and holding circuits, simultaneously opening other switches and for switching said first and second multiplexers of each said sampling and holding circuit by a predetermined combination, and

(B) a comparison circuit for comparing the signal strength of outputs of each said matched filter circuit.

5,815,813

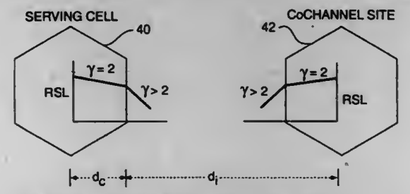
MULTIPATH TOLERANT CELLULAR COMMUNICATION SYSTEM AND METHOD

Saleh Faruque, Plano, Tex., assignor to Northern Telecom Limited, Quebec, Canada

Filed Nov. 24, 1995, Ser. No. 562,391

Int. Cl.[6] H04B *1/06*

U.S. Cl. 455—446 **4 Claims**



1. A cellular communication system, comprising:

a plurality of transceivers for transmitting and receiving predetermined RF frequencies to and from mobile units, each of said plurality of transceivers having an antenna for radiating and collecting the respective RF frequencies and having output power defining a cell corresponding substantially to a first Fresnel zone of the RF frequencies;

each of said transceiver antennae being spaced from one another a distance substantially corresponding to the diameter of the first Fresnel zone;

each of said cells having a boundary which forms an annulus of attenuated radiated power and the annulus surrounding each cell overlaps adjacent cells; and

each boundary of said cell substantially coincides with the first Fresnel zone breakpoint determined by the equation: $d_0 = d = 4h_1h_2/\lambda$ where d_0 is the first Fresnel zone breakpoint, d is the distance between the transceiver antenna and the mobile antenna, h_1 is the height of the transmit antenna, h_2 is the height of the receive antenna, and λ is the wavelength of the RF frequencies.

5,815,814

CELLULAR TELEPHONE SYSTEM THAT USES POSITION OF A MOBILE UNIT TO MAKE CALL MANAGEMENT DECISIONS

Everett Dennison, and Albert H. Pharis, Jr., both of Canfield, Ohio, assignors to Sygnet Communications, Inc., Canfield, Ohio

Continuation of Ser. No. 402,976, Mar. 13, 1995, abandoned, which is a continuation of Ser. No. 57,833, May 7, 1993, which is a continuation-in-part of Ser. No. 813,494, Dec. 26, 1991, Pat. No. 5,235,633. This application Nov. 22, 1995, Ser. No. 563,897

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 455—456 **17 Claims**

2. A wireless radio communications system such as a cellular telephone system, that includes one or more intra-system cell sites, a system boundary and an MTSO, the wireless radio communications system being located adjacent to at least one neighboring wireless radio communications system carrier having its own cell sites which are inter-system cell sites with respect to the wireless radio communications system, the wireless radio communications system being authorized to provide service to calls handled by the intra-system cell sites, the wireless radio communications system and the neighboring wireless radio communications system carrier being subject to inter-system interference, said wireless radio communications system comprising:

A) locating means in a radio communications system for determining the exact geographic location of a mobile unit; and

B) management means in each MTSO of the wireless radio communications system for making call management decisions based on the geographic location of the mobile unit, said management means including means for storing the geographic location, shape and size of each cell site in the wireless radio communications system and for comparing the exact geographic location of the mobile unit to the geographic location of each cell site and for selecting a cell site for use by the mobile unit based on such comparison, said management means including means for receiving mobile signals from three or more cell sites, circuit means for compensating for time delay of said signals from said three or more cell sites and means for determining distance between each cell site and the mobile unit by triangulation, means for locating the mobile unit in relation to the geographic location of each cell site, and data means in said management means responsive to said locating means for automatically routing a call to completion to provide services requested by a mobile unit user based on the exact geographic location of the mobile unit regardless of cell site location.

5,815,815

Patent Not Issued For This Number

5,815,816

METHOD FOR MANAGING COMMUNICATION CHANNELS IN MOBILE TELECOMMUNICATIONS SYSTEM AND RADIOTELEPHONE SYSTEM FOR USE THEREIN

Shinya Isumi, Onojo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 258,873, Jun. 13, 1994, abandoned. This application May 29, 1996, Ser. No. 654,808

Claims priority, application Japan, Jul. 13, 1993, 5-173068

Int. Cl.[6] H04Q *7/38*

U.S. Cl. 455—458 **14 Claims**

1. A method for managing a digital radiotelephone system, comprising the steps of:

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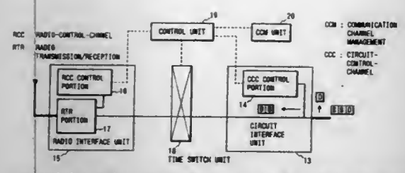


transmitting an incoming call signal to a called radio subordinate unit through a radio transmission/reception portion of a radio interface unit by use of a control unit of a base station without performing an acquisition of a digital wire circuit communication channel between a radio control station and the base station when the base station receives a call setup message sent from the radio control station for the called radio subordinate unit through a circuit-control-channel control portion of a circuit interface unit, the call setup message passing through a digital wire circuit;

acquiring the digital wire circuit communication channel between the radio control station and the base station by use of a communication channel management unit, at a moment at which it is known that the called radio subordinate unit is present in a radio area of the base station; and

connecting the base station and the called radio subordinate unit through a radio communication channel after the acquisition of the digital wire circuit communication channel.

5,815,817

INFORMATION BROADCASTING METHOD

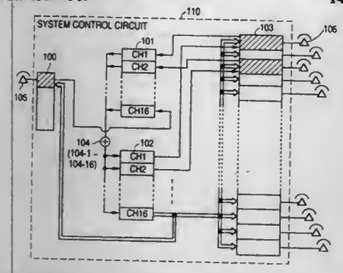
Kazuhiro Suzuki, Fujiyoshida, Japan, assignor to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1996, Ser. No. 689,104

Claims priority, application Japan, Jul. 31, 1995, 7-195284

Int. Cl.[6] H04Q *9/00*

U.S. Cl. 455—509 **14 Claims**



1. An information broadcasting met hod for a communication system including a plurality of stations, the communication system enabling any two of the stations to communicate with one another, the information broadcasting method comprising the steps of:

providing the communication system with a conference trunk having at least four channels, each of the channels having an input and an output normally unconnected to the input;

assigning one of the channels to be an information broadcasting channel for use only in information broadcasting wherein any one of the stations broadcasts information to all of the stations simultaneously via the information broadcasting channel after the one station issues an information broadcasting instruction;

assigning all other ones of the channels to be conference communication channels for use in conference communication wherein any three or more of the stations communicate with one another simultaneously via any three or more of the conference communication channels after any one of the three or more stations issues a conference communication instruction;

issuing the information broadcasting instruction from any one of the stations;

connecting the station which issued the information broadcasting instruction to the input of the information broadcasting channel in response to the information broadcasting instruction;

connecting the output of the information broadcasting channel to the input of the information broadcasting channel in response to the information broadcasting instruction;

connecting all of the stations to the output of the information broadcasting channel in response to the information broadcasting instruction, thereby connecting the station which issued the information broadcasting instruction to all of the stations via the information broadcasting channel;

broadcasting information from the station which issued the information broadcasting instruction to all of the stations via the information broadcasting channel;

issuing a conference communication instruction from any one of the stations except the station which issued the information broadcasting instruction while the station which issued the information broadcasting instruction is broadcasting information to all of the stations;

connecting the station which issued the conference communication instruction to the output of the information broadcasting channel in response to the conference communication instruction, thereby connecting the station which issued the conference communication instruction to all of the stations via the information broadcasting channel; and

transmitting information from the station which issued the conference communication request to all of the stations via the information broadcasting channel, thereby engaging in bidirectional communication with the station which issued the information broadcasting instruction while the station which issued the information broadcasting instruction is broadcasting information to all of the stations.

5,815,818

CELLULAR MOBILE COMMUNICATION SYSTEM WHEREIN SERVICE AREA IS REDUCED IN RESPONSE TO CONTROL SIGNAL CONTAMINATION

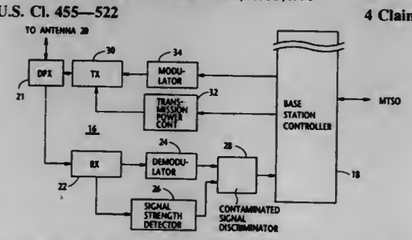
Shoji Tanaka, and Toshiya Tsuji, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 20, 1992, Ser. No. 870,982

Claims priority, application Japan, Apr. 19, 1991, 3-087080

Int. Cl.[6] H04B *7/00;17/00;1/16*

U.S. Cl. 455—522 **4 Claims**



1. A method of controlling service area size of a given cell in response to control channel signal contamination being detected at a base station of said given cell in a cellular mobile communications system, comprising the steps of:

sensing the control channel signal contamination which inhibits communication between a mobile unit and a transceiver of the base station;

detecting the contaminated control channel signal level; and

reducing the transmission power of the transceiver of the base station, in response to the contaminated control channel signal level, to a level whereat communication between a base station of a cell adjacent to said given cell and the mobile unit is enabled.

5,815,819

INTERMITTENT RECEPTION CONTROL APPARATUS

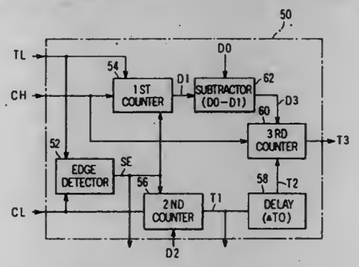
Hiroyuki Ohta, Kariya; Hiroaki Shibata, Nagoya, and Akio Kosaka, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 28, 1996, Ser. No. 672,552

Claims priority, application Japan, Jun. 30, 1995, 7-165629

Int. Cl.[6] H04B *1/38;* **H04M** *1/00*

U.S. Cl. 455—574 **15 Claims**



1. An intermittent reception control apparatus, provided in a reception unit for intermittently receiving transmission data transmitted from a base station at a predetermined time period and for setting an intermittent reception timing, said apparatus comprising:

a high frequency oscillator for oscillating and outputting high frequency clock pulses in a cyclic period shorter than a transmission cyclic period for one bit of data of said base station;

a low frequency oscillator for oscillating and outputting low frequency clock pulses in a cyclic period longer than said transmission cyclic period for one bit of data of said base station;

edge detecting means for detecting an edge of said low frequency clock pulses outputted from said low frequency oscillator;

first high frequency clock counting means for counting a number of said high frequency clock pulses outputted from said high frequency oscillator after said reception unit comes to wait for said transmission data transmitted from said base station until an initial edge is detected by said edge detecting means;

low frequency clock counting means for counting a number of said low frequency clock pulses after said initial edge is detected by said edge detecting means and for generating a timing signal when said counted number of said low frequency clock pulses counted by said low frequency clock counting means reaches a predetermined number;

second high frequency clock counting means for counting a number of said high frequency clock pulses after said timing signal is outputted from said low frequency clock counting means and for generating an intermittent reception start timing signal when said counted number of said high frequency clock pulses counted by said second high frequency clock counting means reaches a predetermined number;

counted value setting means for setting said predetermined number of said high frequency clock pulses to be counted by said second high frequency clock counting means based on said number of said high frequency clock pulses counted by said first high frequency clock counting means and a preset number of clock pulses; and

high frequency oscillator stopping means for stopping said oscillation of said high frequency oscillator while said low frequency clock counting means is counting said low frequency clock pulses.

5,815,820

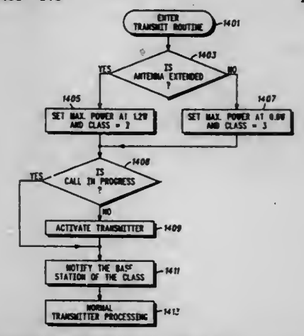
TRANSMITTER HAVING ADJUSTABLE POWER LEVELS RESPONSIVE TO THE POSITION OF A MOVABLE ANTENNA

Joshua P. Kiem, Park Ridge; Michael P. Metroka, Algonquin; Kevin D. Kaschke, Hoffman Estates, and Raymond A. Jenski, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 729,502, Jul. 12, 1991. This application May 11, 1992, Ser. No. 880,918

Int. Cl.[6] H04B *1/38*

U.S. Cl. 455—575 **22 Claims**



1. A portable radiotelephone comprising:

an antenna element moveable between a stowed position and an unstowed position;

a detector for detecting the movement of the antenna element between the stowed and the unstowed position, wherein the movement of the antenna causes the detector to be in a first state when the antenna element is moved to the stowed position and causes the detector to be in a second state when the antenna element is moved to the unstowed position;

a transmitter for transmitting a signal at a first power level or a second power level, wherein the second power level is greater than the first power level; and

a controller, coupled to the detector and the transmitter, wherein the controller controls the transmitter to transmit the signal at the first power level when the detector is in the first state and controls the transmitter to transmit the signal at the second power level when the detector is in the second state.

5,815,821

METHOD AND A DEVICE FOR CONSERVING POWER IN A BATTERY POWERED TRANSCEIVER

Mats G. Pettersson, Lund, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 371,392, Jan. 11, 1995, abandoned. This application Nov. 13, 1997, Ser. No. 969,461

Claims priority, application Sweden, Jan. 12, 1994, 9400054

Int. Cl.[6] H04B *1/38*

U.S. Cl. 455—575 **20 Claims**

1. A method of conserving power in a battery powered transceiver, said transceiver comprising a transmitter and a receiver having receiving circuits including an input high frequency stage, a first mixer, and a first local oscillator, said receiver fulfilling requirements placed upon receiver parameters as set out in specifications of a telecommunication system in which said transceiver is used, said method including the steps of obtaining a transmit control signal, when a transmitter of said transceiver is transmitting, and biasing said receiving circuits to full operating level as a response to said transmit control signal, wherein the biasing step includes the steps of

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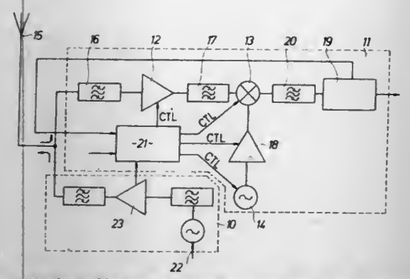


generating a bias control signal as a function of said transmit control signal and of a received signal strength indicating signal, said indicating signal being weighted so as to reduce its influence upon said bias control signal, when said requirements so permit, and

biasing at least two of said receiving circuits to respective levels lower than said full operating level and controlled by said bias control signal, the respective values of said lower levels being set independently of each other and in accordance with said requirements to minimize said lower levels, while conforming to said requirements.

5,815,822

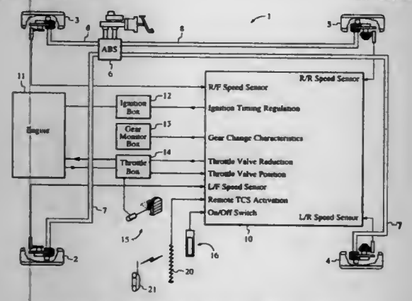
APPARATUS FOR REMOTELY CONTROLLING A VEHICLE IN MOTION

Howard Iu, 22 Lacewood Crescent, Don Mills, Ontario, Canada, M3A 2Z4

Filed Mar. 12, 1996, Ser. No. 615,394

Int. Cl.[6] B60R *25/10;* **H04Q** *9/00*

U.S. Cl. 701—2 **12 Claims**



1. Apparatus for control of a moving vehicle comprising:

(a) an electronically-activated traction control system for control of traction of the wheels of the vehicle, said system having computer software for control of the system;

(b) a receiver for receiving an electronic signal and which is capable of being activated from a remote location; and

(c) a controller within the traction control system capable of being activated by a signal transmitted to the receiver and, on said activation, implement the computer software to effect a reduction in the speed of the motor vehicle by activation of the traction control system.

5,815,823

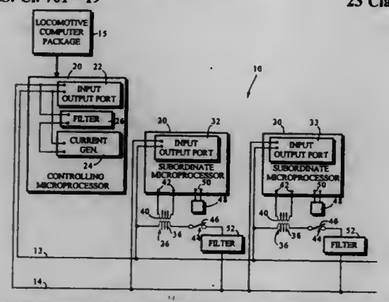
MICROPROCESSOR CONTROLLED RAILWAY CAR ACCOUNTING AND COMMUNICATION SYSTEM

Thomas H. Engle, Clayton, N.Y., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 23, 1996, Ser. No. 772,326

Int. Cl.[6] G06F *7/70*

U.S. Cl. 701—19 **23 Claims**



1. An apparatus for enabling a controlling information processing unit to communicate individually with a plurality of subordinate information processing units disposed sequentially along and connected to a pair of primary electrical conduction paths, said apparatus enabling said controlling information processing unit to assign and transmit a unique address to said subordinate information processing unit, said apparatus comprising:

(a) an information communication channel connecting said controlling information processing unit to said subordinate information processing units;

(b) said controlling information processing unit having a controlling information processing unit signal output means connected to said information communication channel for placing signals from such controlling information processing unit onto said information communication channel;

(c) each of said subordinate information processing units having a subordinate information processing unit signal input means connected to said information communication channel for receiving signals from said information communication channel into said subordinate information processing unit;

(d) an electrical current generator connected to said pair of primary electrical conduction paths, said electrical current generator controlled by said controlling information processing unit for placing a primary electric current on a first one of said pair of primary electrical conduction paths, while receiving a primary return current on a second one of such pair of primary electrical conduction paths;

(e) a plurality of shunt electrical conduction paths, each connected to a subordinate information processing unit and to said pair of primary electrical conduction paths, each of said shunt electrical conduction paths for conveying a shunt electrical current from said first one of such pair of primary electrical conduction paths to said second one of said such primary electrical conduction paths, each of said shunt electrical conduction paths including a switch in series with an electrical current measuring means, said electrical current measuring means providing a measurement of said shunt electrical current to said subordinate information processing unit, said switch having an open position and a closed position, said switch controlled by said subordinate information processing unit;

(f) comparison means disposed in each subordinate information processing unit for comparing said value of said shunt electrical current with a predetermined shunt current value, and for generating a first signal indicating that said shunt electrical current exceeds said predetermined shunt current value, said predetermined shunt current value having such magnitude that only one of said shunt electrical currents exceeds said predetermined shunt current value, said only one of said shunt electrical current values being for one of said shunt electrical conduction paths having said switch closed, and being closer along said primary electrical conduction paths to said electrical current generator than any other shunt electrical conduction path having a closed switch;

(g) address sending means disposed within said controlling information processing unit to create a unique address for said subordinate information processing unit, and to place a second signal indicative of said unique address on said information communication channel through said controlling information processing unit signal output means;

(h) address receiving means disposed within said subordinate information processing unit to receive said second signal through said subordinate information processing unit signal receiving means, and in response to said first signal to recognize said second signal as indicative of its own individual address, to place said second signal in an information retaining means in said subordinate information processing unit, and to open said switch connected to said subordinate information processing unit and;

(i) means for said address sending means to determine a time when said switch connected to said subordinate information processing unit has been opened, and to send said second signal for a next one of such subordinate information processing units after said switch has been opened;

whereby said apparatus provides for placement of a unique address in said information retaining means in each of said subordinate information processing units so that such controlling information processing unit can individually address and communicate with any of said subordinate information processing units.

5,815,824

NAVIGATION SYSTEM FOR ELECTRIC AUTOMOBILE

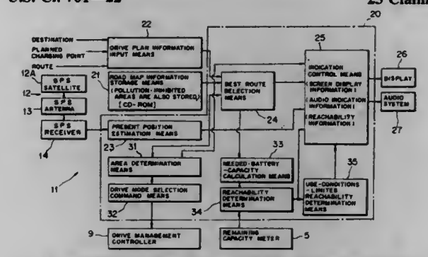
Kenichi Saga, Nagoya, and Nobuyuki Kawamura, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1996, Ser. No. 611,577

Claims priority, application Japan, Mar. 6, 1995, 7-045934

Int. Cl.[6] G01L *21/00;* **B60L** *11/02*

U.S. Cl. 701—22 **23 Claims**



1. A navigation system for an electric automobile having a battery, an electric drive motor for driving wheels by electric power from said battery, motor control means for controlling operation of said electric drive motor by adjusting electric power fed to said electric drive motor in accordance with an output demand operation, and remaining capacity detection means for detecting a remaining capacity of said battery, the navigation system comprising:

road map information storage means for storing road map information;

drive plan information input means for inputting drive plan information including a destination of said automobile;

present position detecting means for detecting a present position of said automobile;

indication control means for controlling at least one of screen display information and audio indication information of map information and route information on the basis of information from said road map information storage means, said drive plan information input means, and said present position detecting means;

reachability determination means for determining, based on a distance planned to be driven by said automobile from the detected present position to said destination and said remaining capacity of said battery determined by said remaining capacity detection means, whether said automobile can reach said destination with said remaining capacity of said battery; and

use-condition-limited reachability determination means for limiting use of electrical power to extend a driving range of said automobile.

5,815,825

VEHICLE GUIDANCE SYSTEM

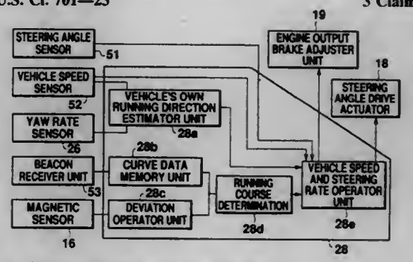
Akihide Tachibana, and Keiji Aoki, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 26, 1996, Ser. No. 607,027

Claims priority, application Japan, Mar. 14, 1995, 7-054271; Jun. 23, 1995, 7-157878

Int. Cl.[6] G06F *165/00*

U.S. Cl. 701—23 **3 Claims**



2. A vehicle guidance system comprising:

(a) a magnetic generator means laid on a road;

(b) road curve data transmitting means laid on the road to transmit road curve data in the running direction of a vehicle, wherein said road curve data transmitting means are beacons installed at the side of the road, said beacons are installed at a larger pitch than that of said magnetic generator means to transmit not only said data on the road curve but also the data on the position of the magnetic generator means laid within signal transmission areas;

(c) magnetic detector means mounted on a vehicle to detect magnetism from said magnetic generator means;

(d) position calculating means mounted on the vehicle to calculate, based on the magnetism detected by said magnetic detector means, the relative position to the road surface;

(e) receiver means mounted on the vehicle to receive the road curve data from said road curve data transmitting means; and

(f) control means mounted on the vehicle to control the running of a vehicle, based on the relative position calculated by said position calculator means and the road curve data received by said receiver means, wherein said vehicle has excitation means in the front thereof, and said road curve data transmitting means has an induction coil for generating induction voltage under influence of the magnetic field produced by said excitation means, and

said road curve data transmitting means transmits said road curve data using the power generated in said induction coil.

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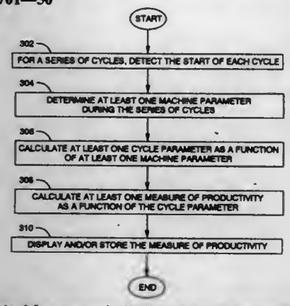
5,815,826

METHOD FOR DETERMINING THE PRODUCTIVITY OF AN EARTH MOVING MACHINES

Daniel E. Henderson, Washington; Charlene L. Oliver, and David A. Paul, both of Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 28, 1996, Ser. No. 623,076
Int. Cl.[6] G01C *21/00*
U.S. Cl. 701—50 14 Claims



1. A method for automatically determining the productivity of an earthmoving machine in real-time using an onboard computer, the earthmoving machine operating in cycles having a first portion and a second portion, the earthmoving machine moving in a first direction during the first portion and in a second direction during the second portion, comprising:

for a series of cycles, detecting the start of each cycle;

determining a start position of the earthmoving machine at the start of the first portion of each said cycle;

determining an end position of the earthmoving machine at the end of the first portion of each said cycle;

calculating a horizontal distance moved as a function of said start and end positions for each said cycle;

calculating a slope as a function of said start and end positions for each said cycle;

calculating a cumulative horizontal distance traversed; calculating a cumulative slope traversed; and

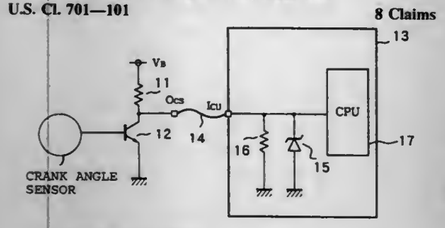
calculating a measure of productivity as a function of at least one of said cumulative horizontal distance and said cumulative slope traversed.

5,815,827

CRANK ANGLE SIGNAL PROCESSING APPARATUS

Naoki Tomisawa, and Satoru Watanabe, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Kanagawa-ken, Japan

Filed Apr. 30, 1996, Ser. No. 640,384
Claims priority, application Japan, May 15, 1995, 7-115499
Int. Cl.[6] G05B *15/00;* G06F *9/46*
U.S. Cl. 701—101 8 Claims



1. An apparatus comprising:

a crank angle sensor which outputs a crank angle signal as a pulse which is generated for each predetermined crank angle of rotation of an internal combustion engine, and

a processing circuit for processing the crank angle signal from said crank angle sensor, said crank angle sensor being connected to said processing circuit via a signal lead,

wherein an output side circuit of said crank angle sensor includes a switch element which is connected in series with a power source, and which outputs the crank angle signal pulse in response to the switching on and off of the switch element, wherein the level of said crank angle signal is high during the pulse generation and is low level when pulse is absent, and

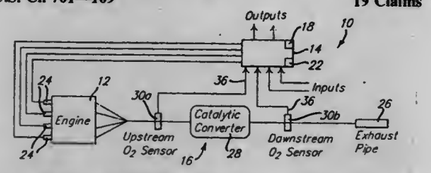
wherein an input side circuit of said processing circuit includes a voltage reducing circuit which, during the pulse generation, pulls down a voltage of the power source to a predetermined voltage and supplies this predetermined voltage to an arithmetic processing section and which simultaneously allows electrical current to flow through the signal lead and prevent the formation of oxidation film on terminals at both ends of the signal lead.

5,815,828

METHOD OF MEASURING TEMPERATURE OF A CATALYTIC CONVERTER

Robert J. Nankee, II, Canton; George C. Mitchell, Brighton, and Mark E. McMackin, Royal Oak, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Jul. 8, 1997, Ser. No. 889,269
Int. Cl.[6] G01M *15/00*
U.S. Cl. 701—109 19 Claims



1. A method of measuring temperature of a catalytic converter in a motor vehicle, said method comprising the steps of:

measuring a first oxygen sensor output;

determining if it is time to determine a second oxygen sensor output using a timer;

determining the second oxygen sensor output if it is time to determine the second oxygen sensor output;

determining a change in oxygen sensor output by taking a difference between the first oxygen sensor output and the second oxygen sensor output;

finding a catalytic converter temperature in a look-up table using the change in oxygen sensor output; and

sending the catalytic converter temperature to an electronic controller to operate an engine of the motor vehicle.

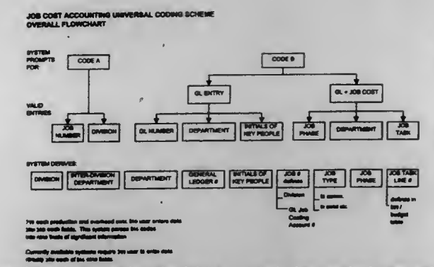
5,815,829

JOB COST ACCOUNTING DATA COMPRESSION AND INDEXING SYSTEM AND METHODS FOR DOING THE SAME

Dara Zargar, 60 W. 75th St. Apt. 6A, New York, N.Y. 10023

Filed Jul. 19, 1995, Ser. No. 504,223
Int. Cl.[6] G06F *7/00*
U.S. Cl. 705—30 24 Claims

1. A method for organizing cost data for financial records pertaining to a project or job separately from the general ledger



and for incorporating the job as a whole into a single general ledger entry in a system, the steps comprising:

Providing two related data entry fields and entering a first set of data into a first data entry field of said two related data entry fields and a second set of data into a second data entry field of said two related data entry fields, said first set of data representing either a blank field, a job number, a division, or a division and a job number, and said second set of data representing either general ledger information or job cost information so that said first set of data and said second set of data together represent either general ledger information or job cost information;

storing said first set of data and said second set of data into data structures called tables by means of one of either disk storage means or modem transmission means to transmit to remote system locations;

analyzing and obtaining significant data information from each of said data sets for parsing, which includes the steps of separating job cost information from general ledger information and interpreting job cost information to permit use of different user defined numbering systems which are entered into said second data entry field; and

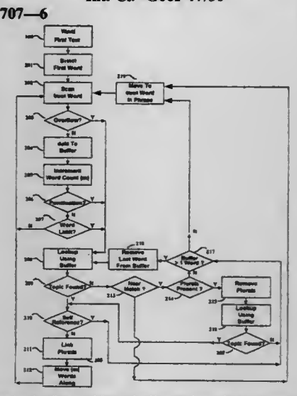
generating one of either a general ledger report which gathers and summarizes data information related to a particular job and includes that information as a single entry in the report or a detailed job cost report which gathers all phases and tasks of each job.

5,815,830

AUTOMATIC GENERATION OF HYPERTEXT LINKS TO MULTIMEDIA TOPIC OBJECTS

Andre Charles Anthony, Hunters House, Cheshunt/Herts, United Kingdom, EN7 6HQ

Filed Dec. 18, 1995, Ser. No. 575,728
Claims priority, application United Kingdom, Dec. 23, 1994, 9426165
Int. Cl.[6] G06F *17/30*
U.S. Cl. 707—6 25 Claims



1. A method of searching similar strings in a system for associating portions of text stored in an information retrieval system, the system including:

a display; and

a store for storing data as a plurality of portions of text, each portion of text relating to a particular topic, and having a unique topic name stored therewith;

said method of searching comprising:

comparing a first concatenated string of words in said text with said topic names;

determining whether a topic name matches said concatenated string;

removing one of the words from the concatenated string to form a new string if no match is found; and

comparing the new string with said topic names.

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PATENTS

GRANTED September 29, 1998

ERRATA

Designs

For CLASS	See PATENT NO.
D23—499	D398,997

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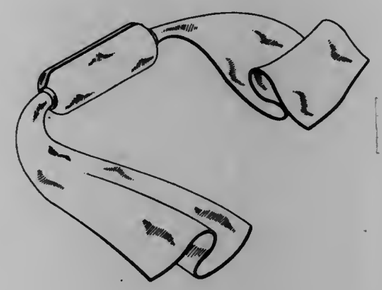
DESIGNS

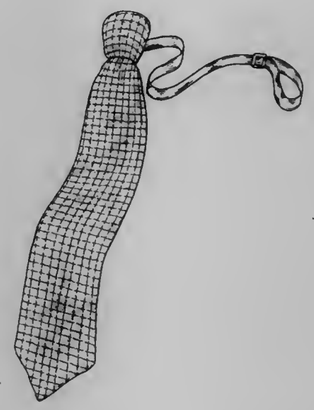
SEPTEMBER 29, 1998

398,735
SCARF INCORPORATING A PILLOW TO MINIMIZE THE POSSIBILITY OF A CONCUSSION
Dorsey W. Bryant, 875 Boynton Ave., Apt. 15C, Bronx, N.Y. 10473
Filed Jul. 28, 1997, Ser. No. 74,711
Term of patent 14 years
LOC (6) Cl. 02 - *05*
U.S. Cl. D2—501

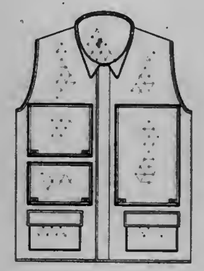


398,736
NECKWEAR
Janine K. Hamilton, 12 Boulder Hill Rd., Lebanon, N.J. 08833
Filed Jul. 11, 1997, Ser. No. 73,384
Term of patent 14 years
LOC (6) Cl. 02 - *02*
U.S. Cl. D2—600

398,737
NECKTIE
Harry M. Umann, 23010 Lake Forest Dr. #337, Laguna Hills, Calif. 92653
Filed Sep. 26, 1997, Ser. No. 77,072
Term of patent 14 years
LOC (6) Cl. 02 - *05*
U.S. Cl. D2—605



398,738
FISHING VEST
Steve De La Rosa, 1124 Birch St., Grand Prairie, Tex. 75050
Filed May 29, 1997, Ser. No. 71,383
Term of patent 14 years
LOC (6) Cl. 02 - *02*
U.S. Cl. D2—829



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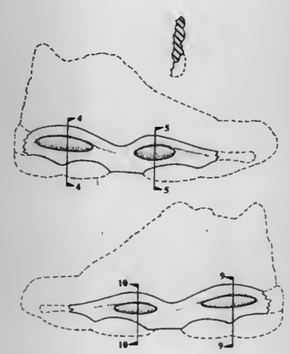
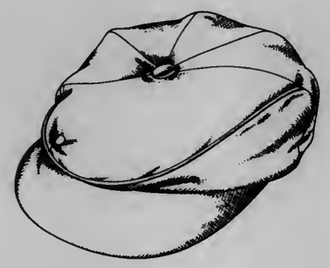
398,739
MOTHER'S BLANKET
Alycia L. Clark, P.O. Box 2974, Greensboro, N.C. 27402
Filed Mar. 29, 1996, Ser. No. 52,411
Term of patent 14 years
LOC (6) Cl. 02 - *02*
U.S. Cl. D2—864

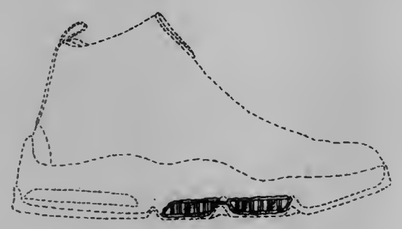
398,740
PORTION OF A SHOE SOLE
Scott Hewett, Quincy, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Apr. 15, 1997, Ser. No. 69,427
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—947



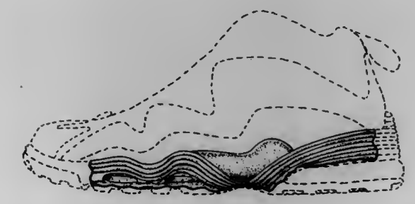
398,741
HEADWEAR
Ella, Pembroke Pines, Fla., assignor to De/Ella, Inc., Pembroke Pines, Fla.
Filed Jul. 16, 1997, Ser. No. 73,721
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D2—887



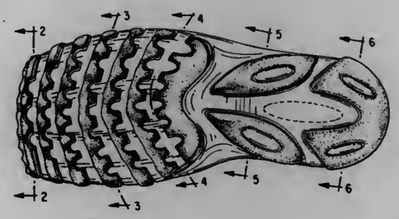
398,742
PORTION OF A SHOE SOLE
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,776
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—947



398,743
PORTION OF A SHOE SOLE
Matthew N. Rask, Boring, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,908
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—947

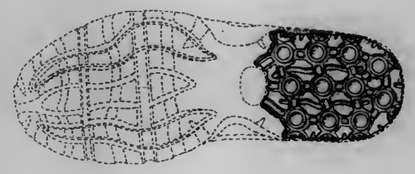


398,744
SURFACE PORTION OF A SHOE OUTSOLE
Tracy L. Teague, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 4, 1996, Ser. No. 55,436
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—954



398,745
PORTION OF A SHOE OUTSOLE
William J. Cass, Hillsboro, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Mar. 19, 1998, Ser. No. 85,256
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—954

398,746
PORTION OF A BOTTOM SURFACE OF A SHOE OUTSOLE
Matthew N. Rask, Boring, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,902
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—955



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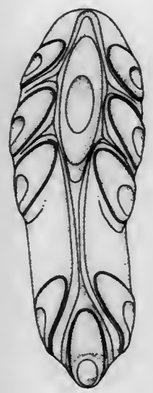
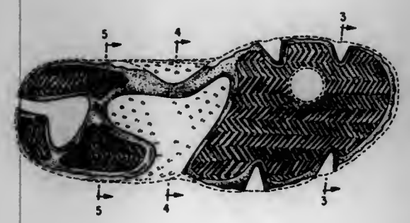
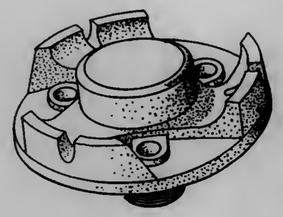
398,747
ATHLETIC SHOE SOLE
Toby Rohrbach, Mission Viejo, Calif., and James H. Jannard, Eastsound, Wash., assignors to Oakley, Inc., Foothill Ranch, Calif.
Filed Jan. 20, 1998, Ser. No. 82,264
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—956



398,748
PORTION OF A BOTTOM SURFACE OF A SHOE OUTSOLE
Tinker Linn Hatfield, Portland, and Mark J. Smith, Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 65,757
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—960



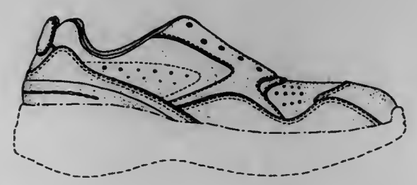
398,749
GOLF SHOE CLEAT
Kenneth Santos, Taunton, Mass., assignor to Lisco Inc., Tampa, Fla.
Filed Jul. 24, 1997, Ser. No. 73,947
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—962



398,750
SHOE UPPER
Gary P. Duclos, Newbury Port, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.
Filed Mar. 3, 1997, Ser. No. 67,297
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969

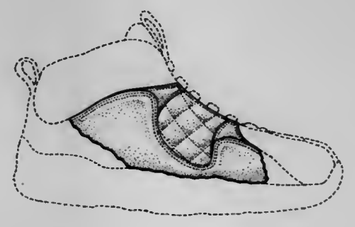
398,751
SHOE UPPER
Jonathan H. Werman, Lighthouse Point, Fla., assignor to American Sport Line, Inc., Boca Raton, Fla.
Filed Apr. 1, 1997, Ser. No. 68,397
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969

398,752
SHOE UPPER
David Pelsue, Boyleston, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.
Division of Ser. No. 63,715, Dec. 13, 1996, Pat. No. Des. 391,752. This application Jan. 9, 1998, Ser. No. 81,767
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969



398,753
SHOE UPPER
Peter von Conta, Putnam, Conn., and Gary P. Duclos, Newbury, Mass., assignors to The Rockport Company, Inc., Marlboro, Mass.
Division of Ser. No. 67,296, Mar. 3, 1997. This application Feb. 3, 1998, Ser. No. 82,992
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969

398,754
PORTION OF A SHOE UPPER
Robert McCourt, Newberg, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 16, 1997, Ser. No. 78,078
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



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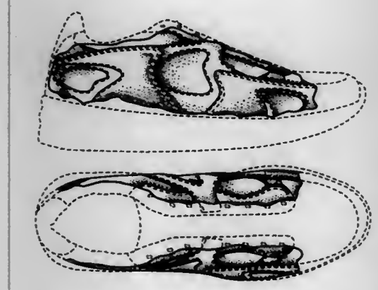
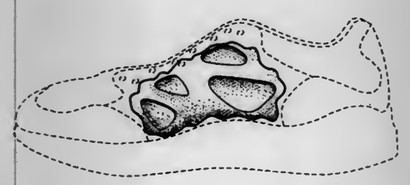
398,755
SIDE ELEMENT OF A SHOE UPPER
Thomas J. Gray, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 21, 1997, Ser. No. 78,218
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



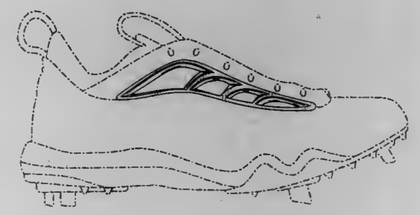
398,756
SIDE ELEMENT OF A SHOE UPPER
James Tong, Tigard, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Nov. 7, 1997, Ser. No. 79,100
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



398,757
SIDE ELEMENT OF A SHOE UPPER
Robert McCourt, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 12, 1998, Ser. No. 81,984
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972

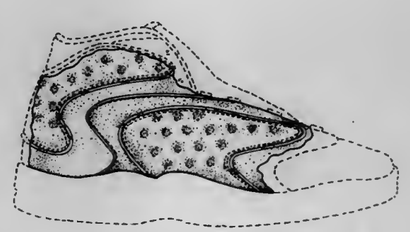
398,758
PORTION OF A SHOE UPPER
John P. Hlavacs, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 13, 1998, Ser. No. 82,050
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972

398,759
ELEMENT OF A SHOE UPPER
John P. Hlavacs, Porland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 13, 1998, Ser. No. 82,051
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



398,760
PORTION OF A SHOE UPPER
Matthew N. Rask, Boring, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,778
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972

398,761
PORTION OF A SHOE UPPER
Wilson Smith, III, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,782
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



398,762
PORTION OF A SHOE UPPER
Sean M. McDowell, and David J. Schenone, both of Beaverton, Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jan. 30, 1998, Ser. No. 82,889
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972

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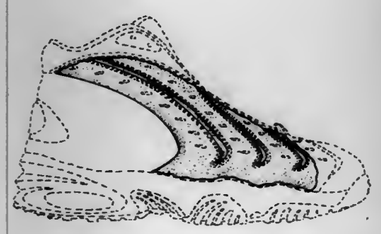
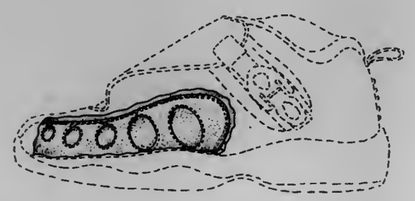
398,763
SIDE ELEMENT OF A SHOE UPPER
Lawrence G. Selbiger, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 13, 1998, Ser. No. 83,553
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972

398,764
PORTION OF A SHOE UPPER
John Hlavacs, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 20, 1998, Ser. No. 83,945
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972



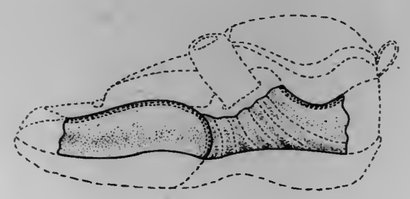
398,765
PORTION OF A SHOE UPPER
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 2, 1998, Ser. No. 85,957
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972

398,766
PORTION OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 21, 1998, Ser. No. 86,840
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972

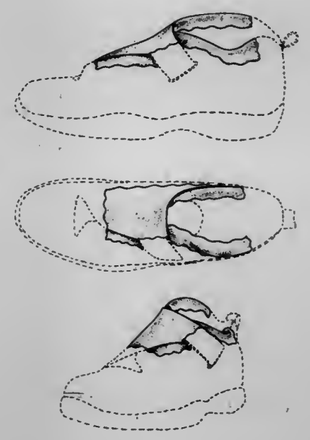


398,767
Patent Not Issued For This Number

398,768
PORTION OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1998, Ser. No. 87,287
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972



398,769
PORTION OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 30, 1998, Ser. No. 87,288
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—973



398,770
SIDE ELEMENT OF A SHOE UPPER
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 11, 1998, Ser. No. 87,919
Term of patent 14 years
LOC (6) Cl. 02 - 99
U.S. Cl. D2—972

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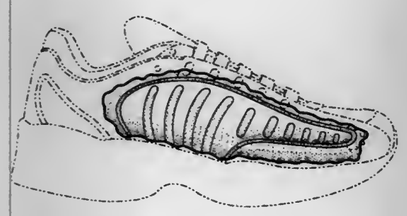
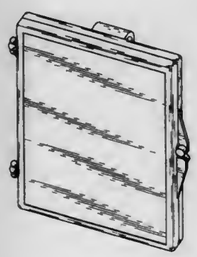
398,771
SIDE ELEMENT OF A SHOE UPPER
Andre Doxey, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 11, 1998, Ser. No. 87,963
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972

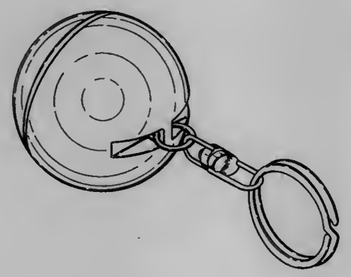


398,772
KIT CONTAINING EMERGENCY MEDICAL INFORMATION
Brent Belden Benham, P.O. Box 646, Meadow Vista, Calif. 95722
Filed Oct. 23, 1997, Ser. No. 78,438
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—203



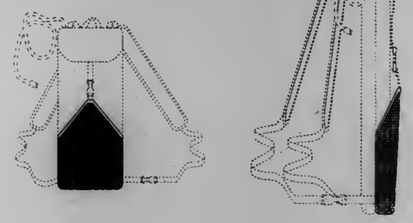
398,773
KEY RING
Tu-Tan Huang, Tainan, Taiwan, assignor to Han Mei Industrial Co. Ltd.
Filed Nov. 7, 1997, Ser. No. 79,040
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—208

398,774
KEY CHAIN LIGHT
Sun Yu, 2850 Coolidge Hwy., Berkley, Mich. 48072-1559
Filed Sep. 10, 1997, Ser. No. 76,559
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—209

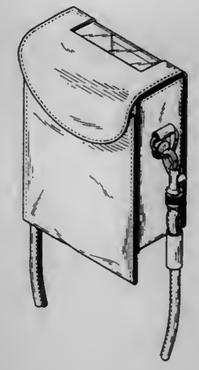


398,775
KEYCHAIN
James T. Fritsche, 6414 Fordham Dr., Parma, Ohio 44129
Filed Jul. 1, 1997, Ser. No. 73,820
Term of patent 14 years
LOC (6) Cl. 03 - *01*; 11 - *01*
U.S. Cl. D3—211

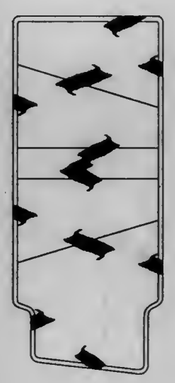
398,776
PACK WITH POCKET
Roger R. Fawcett, Weatherford, Tex., assignor to Fastrak Systems, Inc., Weatherford, Tex.
Filed Aug. 14, 1996, Ser. No. 58,423
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—216



398,777
PAGER CARRIER
Adrienne M. Epstein, 10746 Francis Pl. #305, Los Angeles, Calif. 90034, assignor to Adrienne M. Epstein, Los Angeles, Calif.
Filed Jul. 31, 1997, Ser. No. 75,930
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—218



398,778
EXTERIOR OF A BINDER OR PORTFOLIO
Jon R. Wyant, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Nov. 13, 1996, Ser. No. 62,317
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—303



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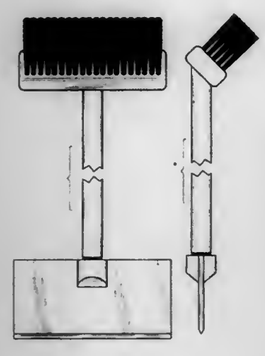
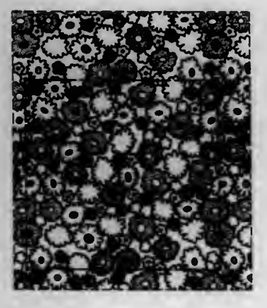
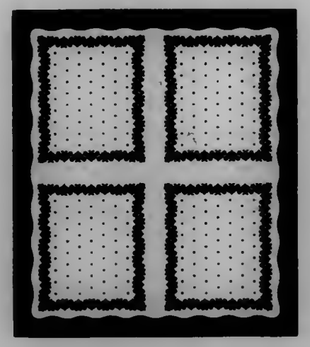
398,779
ELONGATED CLEANING TOOL
Randall D. Ebbenga, 517 N. Broad St., Mankato, Minn. 56001
Filed Dec. 4, 1997, Ser. No. 80,229
Term of patent 14 years
LOC (6) Cl. 04 - *01*
U.S. Cl. D4—118



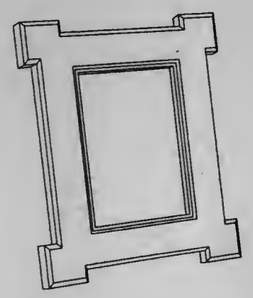
398,780
FABRIC
Amy S. Minkin, Canton, Mass., assignor to SRL, Inc., Wilmington, Del.
Filed Feb. 10, 1997, Ser. No. 66,274
Term of patent 14 years
LOC (6) Cl. 05 - *05*
U.S. Cl. D5—37



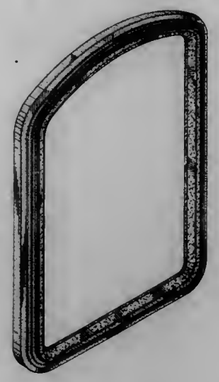
398,781
PAPER PRODUCT
Byron E. Burrier, Neenah, Wis.; Jeffrey W. Hochmiller, Bangor, Pa., and Edward J. Giesler, Sr., Suamico, Wis., assignors to Fort James Corporation, Richmond, Va.
Filed May 6, 1997, Ser. No. 70,338
Term of patent 14 years
LOC (6) Cl. 05 - *06*
U.S. Cl. D5—63



398,782
PICTURE FRAME
Eugenia A. Janke, 641 Fifth Ave., New York, N.Y. 10017
Filed Dec. 30, 1996, Ser. No. 64,388
Term of patent 14 years
LOC (6) Cl. 06 - *07*
U.S. Cl. D6—300

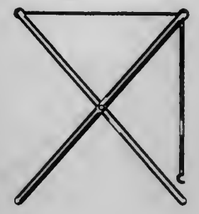


398,783
FRAME FOR MIRRORS
William J. Plein, II, South Windsor, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 23, 1997, Ser. No. 72,152
Term of patent 14 years
LOC (6) Cl. 06 - *07*
U.S. Cl. D6—300

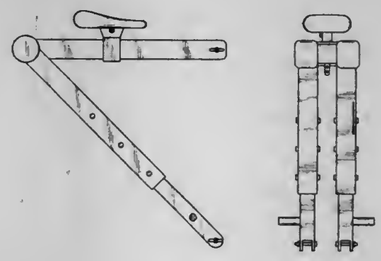


398,784
BABY BATH SEAT
Roberta B. Koehl, and Leon Coresh, both of 6400 Pacific Ave., Unit 101, Playa Del Rey, Calif. 90293
Filed Apr. 29, 1997, Ser. No. 70,374
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—333

398,785
CONVERTIBLE CAMPING STOOL AND TABLE
Terrence Allen Pogue, Manchester, and Kirk J. Miller, Wildwood, both of Mo., assignors to American Recreation Products, Inc., New Haven, Mo.
Filed Feb. 28, 1997, Ser. No. 67,117
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—336



398,786
AUXILARY BICYCLE SEAT
Lenford Kervin, 2212 Ditmas Ave., Brooklyn, N.Y. 11226
Filed Sep. 18, 1997, Ser. No. 76,707
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—354



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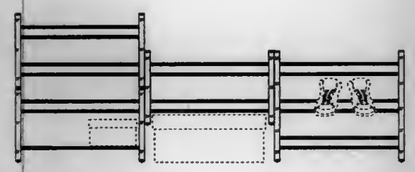
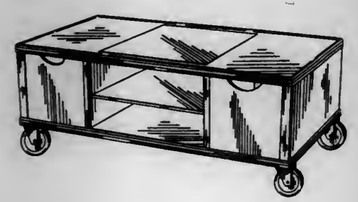
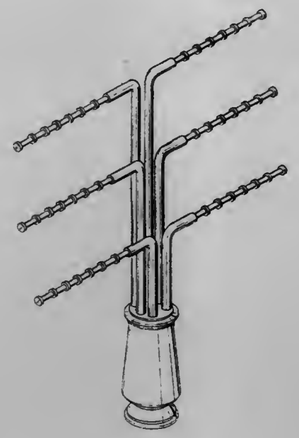
398,787
MODULAR STORAGE RACK FOR SHOES
Vijay S. Malik, 4405 Fairmount, Kansas City, Mo. 64111
Filed Apr. 16, 1997, Ser. No. 69,439
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—411



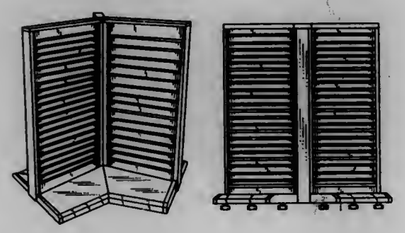
398,788
TABLE
Frederick Karl Schubert, Morganton, N.C., assignor to Drexel Heritage Furnishings, Inc., Drexel, N.C.
Filed Aug. 12, 1997, Ser. No. 75,069
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—436



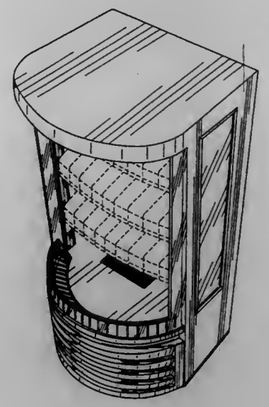
398,789
JEWELRY HOLDER
Jerome Warshawsky, Hewlett Harbor, N.Y., assignor to IW Industries, Inc., Melville, N.Y.
Filed Aug. 11, 1997, Ser. No. 75,129
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—464



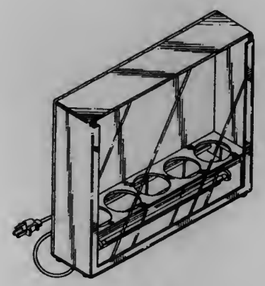
398,790
FREESTANDING MODULAR DISPLAY AND DIVIDER WALL
Daniel D. DePottey, Zeeland; Daniel J. Muellerleile, Grand Haven; Ronald J. Friday, Muskegon, and Vaninath Uppalapati, Portland, all of Mich., assignors to Spectra Products Corporation, Grand Haven, Mich.
Filed Jun. 3, 1997, Ser. No. 71,604
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—468



398,791
CURVED FRONT AIR-CURTAIN MERCHANDISER
Harry A. Brancheau, Inman; Michael D. Black, Simpsonville; John W. Drummond, Woodruff, and Michael A. Branz, Spartanburg, all of S.C., assignors to Specialty Equipment Companies, Inc., Berkeley, Ill.
Filed Oct. 18, 1995, Ser. No. 45,397
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D15—81

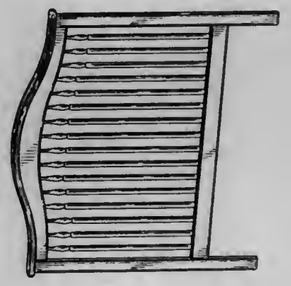


398,792
DISPLAY CASE
Peter VanStolk, Vancouver, Canada, assignor to Urban Juice & Soda Company, Vancouver, Canada
Filed Nov. 12, 1997, Ser. No. 81,925
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—470



398,793
HEAD REST FOR VEHICLE SEATS
Geoff Marée, and Cornelis H. Christiaans, both of Breda, Netherlands, assignors to Johannes Theodorus Marie Rasenberg, Prinsenbeek, Netherlands
Filed Jul. 9, 1996, Ser. No. 56,776
Claims priority, application Benelux TM/Des. Off., Jan. 9, 1996, 26817-00
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—501

398,794
ENDBOARD FOR A CRIB OR BED
Harvey J. Draheim, Weyauwega, Wis., assignor to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Jun. 30, 1997, Ser. No. 73,056
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—508



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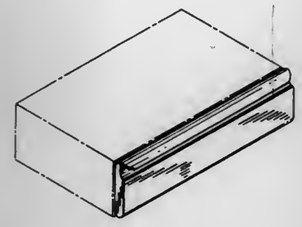
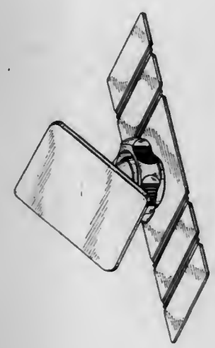
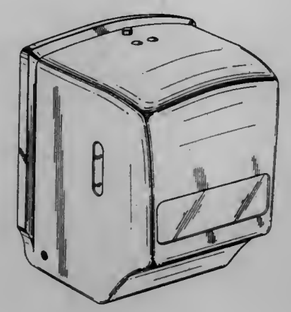
398,795
DRAWER PANEL
Otto Zapf, Theresenstrasse 28, 61462 Konigstein, Germany
Filed May 1, 1997, Ser. No. 70,167
Term of patent 14 years
LOC (6) Cl. 06 - *04*
U.S. Cl. D6—510



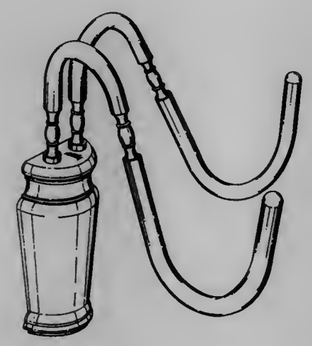
398,796
MOUNTABLE HOLDING DEVICE FOR SECURING AUTOMOTIVE ACCESSORIES
Willy Fauchald, Ridabu, and Knut Larsen, Oslo, both of Norway, assignors to Uniclip AS, Oslo, Norway
Filed May 21, 1997, Ser. No. 71,029
Claims priority, application Norway, Nov. 22, 1996, 960862
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D6—512



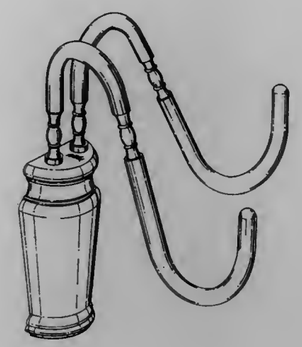
398,797
DISPENSER COVER WITH WINDOW
Allen Eugene Brandenburg, Austin, Tex., and Ernest Paul Sedlock, Marietta, Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.
Filed Mar. 3, 1997, Ser. No. 67,412
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—522



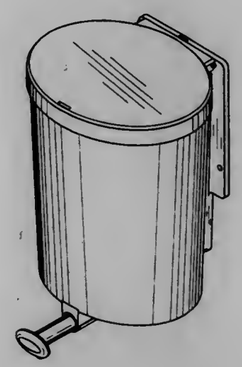
398,798
TOWEL HOLDER
Jerome Warshawsky, Hewlett Harbor, N.Y., assignor to 1W Industries, Inc., Melville, N.Y.
Filed Aug. 11, 1997, Ser. No. 75,143
Term of patent 14 years
LOC (6) Cl. 06 - *02*
U.S. Cl. D6—524



398,799
ROBE HOLDER
Jerome Warshawsky, Hewlett Harbor, N.Y., assignor to 1W Industries, Inc., Melville, N.Y.
Filed Aug. 11, 1997, Ser. No. 75,180
Term of patent 14 years
LOC (6) Cl. 06 - *02*
U.S. Cl. D6—524

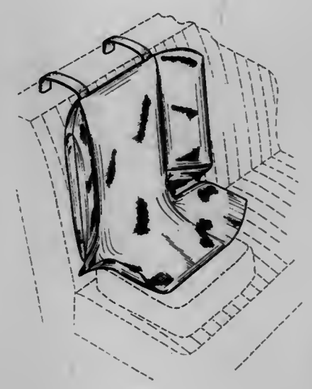


398,800
1.5 GALLON SOAP DISPENSER
Brian Phillips, Joliet; Eric Wilmot, Chicago, and John Kauzlarich, Clarendon Hills, all of Ill., assignors to Steiner Company, Inc., Chicago, Ill.
Filed Sep. 12, 1997, Ser. No. 76,665
Term of patent 14 years
LOC (6) Cl. 07 - *07*
U.S. Cl. D6—545



398,801
WALL MOUNTED PLANTER
Donald Shaw, 170 Commander Blvd., Agincourt, Ontario, Canada, M1S 3C8
Continuation-in-part of Ser. No. 73,886, Jul. 18, 1997. This application Nov. 6, 1997, Ser. No. 78,951
Term of patent 14 years
LOC (6) Cl. 11 - *02*
U.S. Cl. D6—556

398,802
CHILD BOLSTER PILLOW FOR A CAR SEAT
Rebecca C. Quinn, 3946 Great Falls Hwy., Lancaster, S.C. 29720
Filed May 13, 1997, Ser. No. 70,687
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



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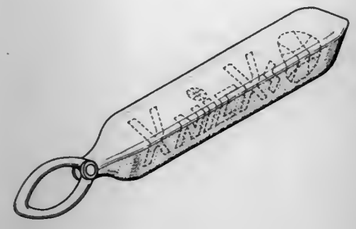
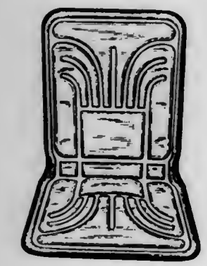
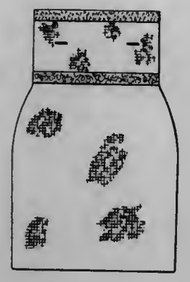
398,803
CHEERING PILLOW
Eugene T. Motes, 52-H Hall Manor, Harrisburg, Pa. 17104
Filed Nov. 4, 1997, Ser. No. 78,843
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



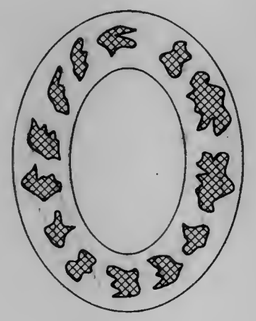
398,804
MASSAGING SYSTEM SEAT CUSHION
Craig M. Loud, Whittier, Calif., assignor to JB Research, Inc., Bellflower, Calif.
Division of Ser. No. 51,537, Mar. 13, 1996. This application Oct. 24, 1997, Ser. No. 79,133
Term of patent 14 years
LOC (6) Cl. 06 - *09*
U.S. Cl. D6—601



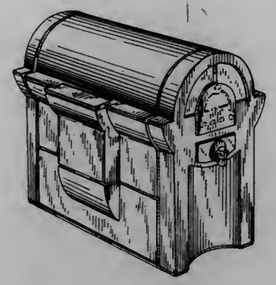
398,805
TOWEL
Patrick H. Sigmon, 5113 SE. Fifteenth St., Del City, Okla. 73115
Filed Nov. 12, 1997, Ser. No. 79,300
Term of patent 14 years
LOC (6) Cl. 06 - *13*
U.S. Cl. D6—608



398,806
TOILET SEAT STRETCH COVER
Robert J. Thomas, 3 Swarthmore Rd., Wellesley, Mass. 02181-6608
Filed Feb. 21, 1997, Ser. No. 66,792
Term of patent 14 years
LOC (6) Cl. 06 - *13*
U.S. Cl. D6—611



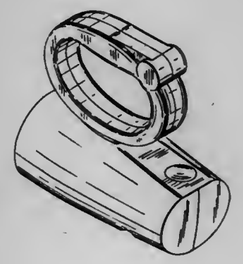
398,807
APPARATUS FOR THE PRODUCTION OF WINE
Tommy Fjelde, Sandnes, Norway, assignor to Fermento International AS, Sandnes, Norway
Filed Oct. 24, 1997, Ser. No. 78,397
Claims priority, application Norway, Apr. 25, 1997, 970264
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—306



398,808
CONTAINER PORTION OF A BAKING PAN
Paul T. Durst, 716 Antrim Rd, Louisville, Ky. 40207
Continuation-in-part of Ser. No. 59,919, Sep. 18, 1996. This application Mar. 21, 1997, Ser. No. 68,531
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—354

398,809
CORDLESS STICK BLENDER
Scott Henderson, Brooklyn, N.Y., assignor to Conair Corporation, Stamford, Conn.
Filed Oct. 9, 1997, Ser. No. 78,347
Term of patent 14 years
LOC (6) Cl. 31 - *00*
U.S. Cl. D7—376

398,810
HAND MIXER
Morison S. Cousins, Winter Park, Fla., assignor to Dart Industries Inc., Orlando, Fla.
Filed Dec. 10, 1997, Ser. No. 80,454
Term of patent 14 years
LOC (6) Cl. 31 - *00*
U.S. Cl. D7—379



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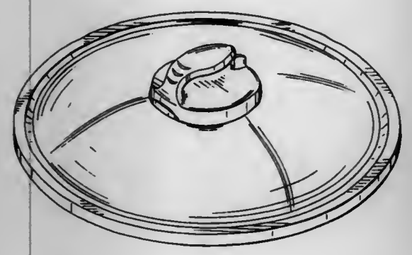
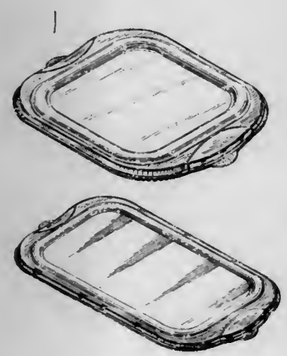
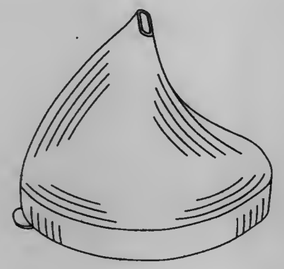
398,811
COVER FOR A COOKING VESSEL WITH A STEAM VENT
Michel Montgelard, Cran Gevrier, France, assignor to Tefal S.A., Rumilly, France
Filed Aug. 28, 1997, Ser. No. 75,301
Claims priority, application France, Feb. 28, 1997, 971.258
Term of patent 14 years
LOC (6) Cl. 07 - *02*
U.S. Cl. D7—391



398,812
SEAL FOR COOKING VESSEL
Douglas M. Laib, Orlando, Fla., assignor to Dart Industries Inc., Orlando, Fla.
Filed Aug. 15, 1997, Ser. No. 74,976
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—392.1

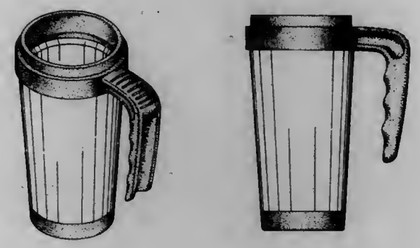


398,813
ATTACHMENT FOR BEVERAGE CONTAINERS
Antonio Franzese, Cedarhurst, N.Y., assignor to Bottoms Up, Inc., Great Neck, N.Y.
Continuation-in-part of Ser. No. 453,809, May 30, 1995, abandoned, and Ser. No. 431,256, Apr. 11, 1995, abandoned. This application Apr. 25, 1997, Ser. No. 70,037
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—396.2

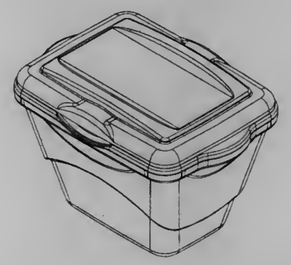


398,814
CUTLERY HANDLE
Andrew John Stokes, Sheffield, England, assignor to McPherson's Limited, Victoria, Australia
Filed Oct. 15, 1997, Ser. No. 78,933
Claims priority, application United Kingdom, Jul. 15, 1997, 2067365
Term of patent 14 years
LOC (6) Cl. 07 - *03*
U.S. Cl. D7—401.2

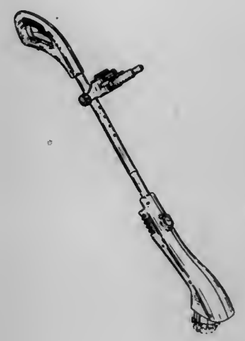
398,815
CUP
Kunio Hatsumoto; Yasuhiro Kowa, and Takeshi Kuwana, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan
Filed Oct. 9, 1997, Ser. No. 77,778
Claims priority, application Japan, Apr. 10, 1997, 9-50827
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—533



398,816
INSULATED CONTAINER
Simone Koutsouflakis, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 27, 1997, Ser. No. 71,834
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D7—605



398,817
VEGETATION CUTTER
Edward Meisner, Short Hills; Thomas Van Dyk, Prospect Park; Michael Ballone, New Providence, all of N.J., and Roger Q. Smith, Reisterstown, Md., assignors to Black & Decker Inc., Newark, Del.
Division of Ser. No. 40,283, Jun. 14, 1995, Pat. No. Des. 382,450. This application Mar. 21, 1997, Ser. No. 68,493
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—8



398,818
ERGONOMIC HANDGRIP FOR SNOW TOOLS
Thomas A. Tisbo, Barrington, Hills, and Stephen P. Whitehead, Elgin, both of Ill., assignors to Suncast Corporation, Batavia, Ill.
Filed Aug. 28, 1997, Ser. No. 76,265
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—8

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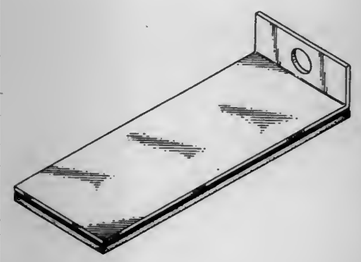
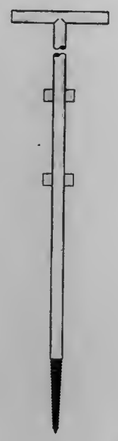
398,819
CONFIRMING TOOL FOR A PIPE CONNECTOR
Masashi Kondou, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan
Filed Mar. 18, 1997, Ser. No. 68,161
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14

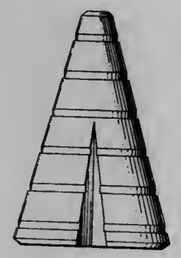
398,820
ROOFER'S SHINGLE BOARD
Daniel Duane Cougar, 13661 Van Dorn Rd., Manassas, Va. 22111
Filed Jun. 13, 1997, Ser. No. 72,293
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14



398,821
TOOL TO REMOVE P.C.V. SCREEN FROM 1986-1990 FORD CARS
Joseph R. Jones, 158 E. 87th St., Brooklyn, N.Y. 11236
Filed Jul. 11, 1997, Ser. No. 73,590
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14



398,822
COMBINED HOLE LOCATOR AND ALIGNMENT TOOL
James Webb, 4025 Spencer St., Suite 304, Torrance, Calif. 90503
Filed Nov. 10, 1997, Ser. No. 79,253
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—14



398,823
SOCKET WRENCH
Chih-Ching Hsieh, No. 64, Lane 107, Liang Tsun Rd., Fong Yuan City, Taichung Hsien, Taiwan
Filed Dec. 3, 1997, Ser. No. 80,366
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—29

398,824
MULTI-FORMING PLIERS
Theodore K. Hunter, 501 Riverside Ave., Paso Robles, Calif. 93446
Filed Jul. 7, 1997, Ser. No. 73,352
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—52

398,825
SCISSORS
Bruno Gstalder, Poisy, France, assignor to Manufacture d'Articles de Precision et de Dessin, Argonay, France
Filed Feb. 24, 1997, Ser. No. 67,275
Claims priority, application Hague Agreement, Sep. 23, 1996, DM/037 612
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—57

398,826
SCISSORS
Emmanuel Jacquet, Annecy, France, assignor to Manufacture d'Articles de Precision et de Dessin, Argonay, France
Filed Feb. 26, 1997, Ser. No. 67,335
Claims priority, application Hague Agreement, Sep. 26, 1996, DM/037 652
The portion of the term of this patent subsequent to Sep. 22, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—57

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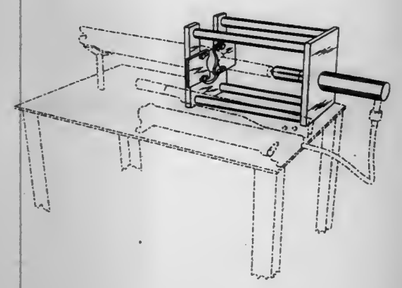
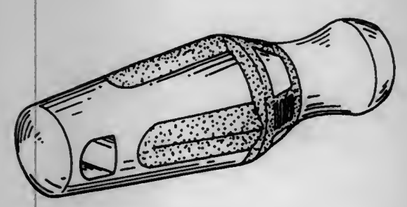
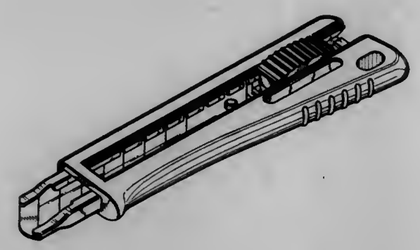
398,827
PARTS SEPARATOR
Andrew M. Vrilakas, 1816 Beverly Way, Sacramento, Calif. 95818
Filed Jun. 30, 1997, Ser. No. 72,773
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—71



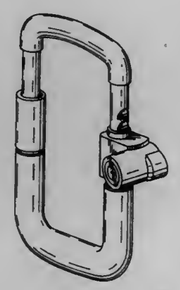
398,828
DRIVER HANDLE
Hsuan-Sen Shiao, No. 55, Cheng-Feng Lane, Tai-Ming Rd., Wu-Jih Hsiang, Taichung Hsien, Taiwan
Filed Jul. 2, 1997, Ser. No. 72,811
Term of patent 14 years
LOC (6) Cl. 08 - *04*
U.S. Cl. D8—83



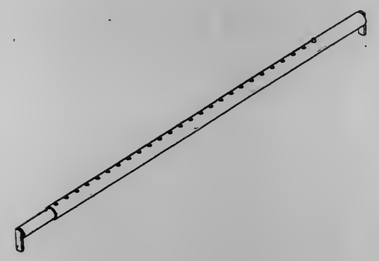
398,829
RETRACTABLE KNIFE
Shoji Okada, Sakai, Japan, assignor to Olfa Kabushiki Kaisha, Japan
Filed Aug. 11, 1997, Ser. No. 74,873
Claims priority, application Japan, May 26, 1997, 9-55787
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—99



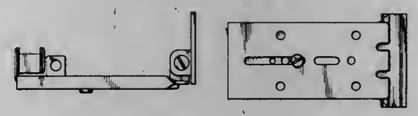
398,830
LOCK
Kevin D. Winner, Hermitage, Pa., assignor to Winner International Royalty Corporation, Sharon, Pa.
Continuation of Ser. No. 61,022, Oct. 15, 1996, Pat. No. Des. 391,142, which is a continuation-in-part of Ser. No. 442,816, May 17, 1995, which is a continuation-in-part of Ser. No. 233,291, Apr. 26, 1994, Pat. No. 5,488,844. This application Aug. 4, 1997, Ser. No. 74,889
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—333



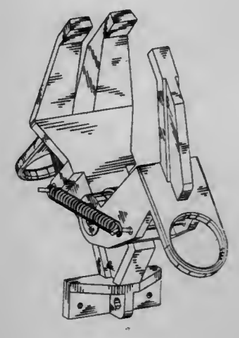
398,831
VEHICLE SECURITY SYSTEM
Sandra Walton, 13033 Green Valley Dr., Balch Springs, Tex. 75180-2581
Filed Jun. 5, 1997, Ser. No. 71,673
Term of patent 14 years
LOC (6) Cl. 08 - *07*
U.S. Cl. D8—339



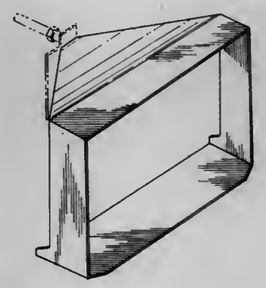
398,832
DRAPERY ROD BRACKET
T. L. Buchanan, Box 467, Manhattan, Mont. 59741
Filed Feb. 27, 1996, Ser. No. 50,831
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—349



398,833
HOLDER ATTACHMENT
Lars Hammar, P.O. Box 15, Bjursås, Sweden, SE-790 21
Filed Sep. 5, 1997, Ser. No. 76,233
Claims priority, application Sweden, Mar. 5, 1997, 97-0520
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—349



398,834
APPLIANCE MOUNT
Edward L. O'Neill, Castro Valley, Calif., assignor to Lucasey Manufacturing Company, Oakland, Calif.
Filed Jan. 10, 1998, Ser. No. 81,904
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—349



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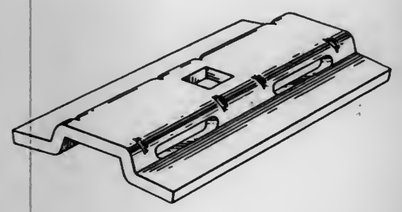
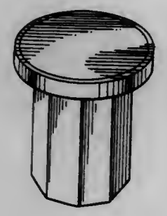
398,835
MOUNTING PLATE
Gene Coll, Cranford, N.J., and Cong Thanh Dinh, Montreal, Canada, assignors to Diamond Communication Products, Inc., Garwood, N.J.
Filed Sep. 5, 1997, Ser. No. 76,278
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—354

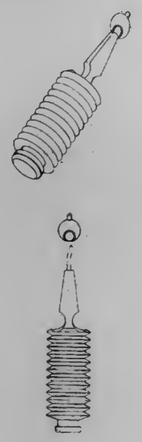


398,836
VERTICAL FASTENER FOR REINFORCING RODS
Edward W. Kalat, Southington, Conn., assignor to Southington Tool & Mfg. Corp., Plantsville, Conn.
Filed Apr. 18, 1997, Ser. No. 69,945
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—370

398,837
MOTORCYCLE NUT
Brian James Spence, 7221 Old Temescal Rd., Corona, Calif. 91719
Filed Jan. 10, 1997, Ser. No. 64,766
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D8—397



398,838
GEL APPLICATOR
Peter Sylvest Nielsen, Vaerloese, Denmark, assignor to Coloplast A/S, Humlebaek, Denmark
Filed Aug. 21, 1997, Ser. No. 75,219
Claims priority, application Denmark, Feb. 21, 1997, MA0224 1997
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—301

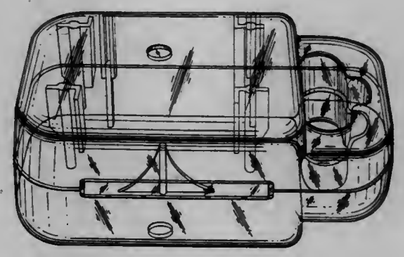


398,839
BOTTLE
Vicky Tiel, 159 E. 63rd St., 1st Floor, N.Y.C., N.Y. 10021
Filed Apr. 22, 1997, Ser. No. 72,893
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—313

398,840
PERFUME BOTTLE HAVING THE SHAPE OF A FLOWER
Angelo Gatti, Biassono, Italy, assignor to Micys Company, S.p.A., Monza, Italy
Filed Oct. 30, 1997, Ser. No. 78,688
Claims priority, application Hague Agreement, May 23, 1997, DM/040 226
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—336

398,841
TRASH BAG RECEPTACLE
Tim Sargent, and Laurie Sargent, both of 14545 Shadywood, Plymouth, Mich. 48170
Filed Apr. 2, 1996, Ser. No. 52,735
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—339

398,842
CONTAINER FOR PACIFIERS
Peter Röhrig, Vienna, Austria, assignor to Mam Bayartikel Gesellschaft M.B.H., Vienna, Austria
Continuation of Ser. No. 27,271, Aug. 17, 1994, abandoned.
This application Mar. 1, 1996, Ser. No. 51,010
Claims priority, application Austria, Feb. 17, 1994, 575/94
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—415



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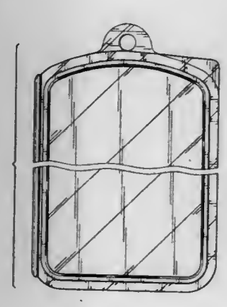
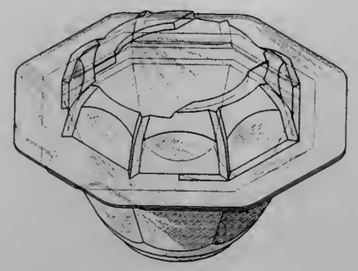
398,843
PACKAGE FOR A TOOTHBRUSH
Georg Wiegner, Flat E, 14/Fl., Hilton Tower, Granville Road, Tsimshatsui, Kowloon, Hong Kong
Filed Jun. 6, 1997, Ser. No. 72,064
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—415

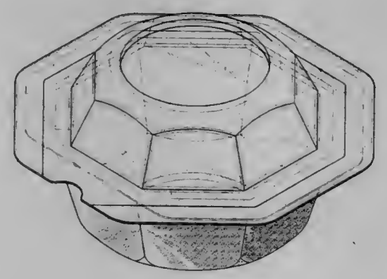
398,844
HERB CONTAINER
Robert Joseph Oberloler, Beaverton, Mich., assignor to Packaging Direct, Beaverton, Mich.
Filed Nov. 7, 1997, Ser. No. 79,058
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—415



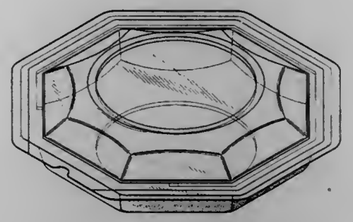
398,845
FOOD PACKAGE
Ihor Wyslotsky, 6133 N. Forest Glen, Chicago, Ill. 60646
Filed Mar. 18, 1997, Ser. No. 69,041
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—425



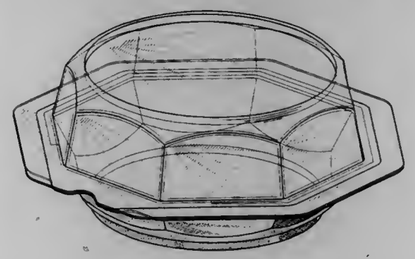
398,846
FOOD PACKAGE
Ihor Wyslotsky, 6133 N. Forest Glen, Chicago, Ill. 60646
Filed Mar. 18, 1997, Ser. No. 69,048
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—425



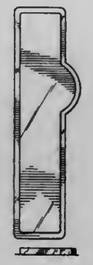
398,847
FOOD PACKAGE
Ihor Wyslotsky, and Oleg Tsoi, both of Chicago, Ill., assignors to Redex Packaging Corp., Schaumburg, Ill.
Filed May 23, 1997, Ser. No. 71,236
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—425



398,848
FOOD PACKAGE
Ihor Wyslotsky, and Oleg Tsol, both of Chicago, Ill., assignors to Redex Packaging Corp., Schaumburg, Ill.
Filed May 23, 1997, Ser. No. 71,859
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—425



398,849
PACKAGE
Jonathan Christopher Hamilton, Tariffville; Paul K. Metaxatos, Collinsville, and David William Schweitzer, West Hartford, all of Conn., assignors to American Saw & Mfg. Company, East Longmeadow, Mass.
Division of Ser. No. 58,625, Aug. 13, 1996, Pat. No. Des. 387,275. This application Aug. 20, 1997, Ser. No. 79,649
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—425



398,850
RIDGE DESIGN FOR A BOTTLE
Norman John Pikul, Mississauga, Canada, assignor to Petro-Canada, Calgary, Canada
Filed Oct. 15, 1997, Ser. No. 78,011
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—434

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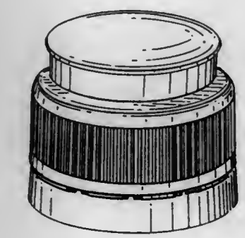
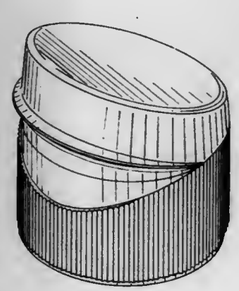
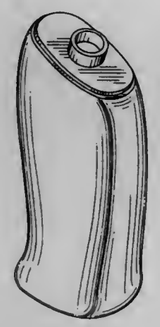
398,851
DISPENSING CLOSURE WITH PRESSURE ACTUATED VALVE
Rick Gaiser, Spring Grove; Valentin Hierzer, Arlington Heights, and Robert Simpson, Grays Lake, all of Ill., assignors to Zeller Plastik, Inc.
Filed Aug. 28, 1997, Ser. No. 76,273
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—447



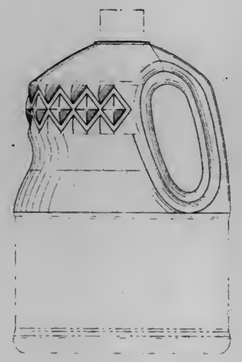
398,852
SLANT TOP CLOSURE FOR A CONTAINER
Richard A. Gross, Oconomowoc, Wis., assignor to AptarGroup, Inc., Crystal Lake, Ill.
Filed Jun. 26, 1997, Ser. No. 72,855
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—453



398,853
BOTTLE
Lauri Jean Phillips, Staten Island, N.Y., assignor to L'Oreal S.A., Paris, France
Filed Nov. 4, 1997, Ser. No. 78,863
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—526



398,854
BOTTLE WITH HANDLE
Timothy Jon Beechuk, and Gerard Laurent Buisson, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 27, 1997, Ser. No. 73,037
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—531

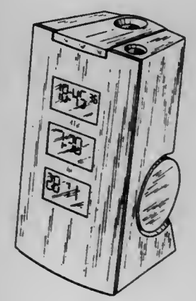


398,855
COMBINED BOTTLE AND CAP
Toru Ito, Paris, France, assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jan. 10, 1997, Ser. No. 64,758
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—537

398,856
UPPER SHOULDER NECK AND CAP OF A BOTTLE
Scott A. Silvenis, Midland, Mich.; George W. Hill, III, Maple Grove, and Timothy M. Kvidera, Anoka, both of Minn., assignors to Reckitt & Colman Inc., Wayne, N.J.
Continuation of Ser. No. 34,931, Feb. 9, 1995, abandoned, Division of Ser. No. 14,016, Oct. 8, 1993. This application Jun. 6, 1996, Ser. No. 55,522
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—542

398,857
CHAMPAGNE BUCKET CLOCK
Frederick N. Levinger, Providence, R.I., assignor to Colibri Corporation, Providence, R.I.
Filed Aug. 22, 1997, Ser. No. 76,068
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—6

398,858
CLOCK
Laura Taylor, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 3, 1995, Ser. No. 41,014
Claims priority, application WIPO, Jan. 24, 1995, DMA/002761
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—15



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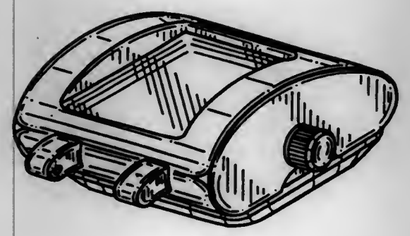
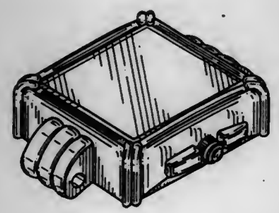
398,859
CASING FOR A WATCH
Amelia Kennedy, Woodbury, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed Feb. 25, 1997, Ser. No. 67,287
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

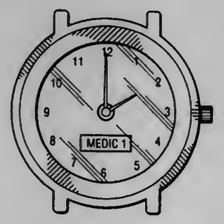


398,860
CASING FOR A WATCH
Edgardo B. Paredes, and Lani E. Cobarrubias, both of Cebu, Philippines, assignors to Timex Corporation, Middlebury, Conn.
Filed Mar. 25, 1997, Ser. No. 68,612
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30



398,861
CASING FOR A WATCH
Judith Reichel Riley, Goshen, Conn., assignor to Time Corporation, Middlebury, Conn.
Filed Jul. 16, 1997, Ser. No. 74,379
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30

398,862
MEDICAL ALERT WRISTWATCH
Douglas Craven, 1522 Joan St., Charleston, S.C. 29407
Filed Nov. 13, 1997, Ser. No. 79,469
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—31

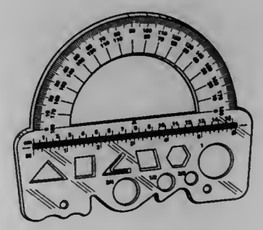


398,863

Patent Not Issued For This Number

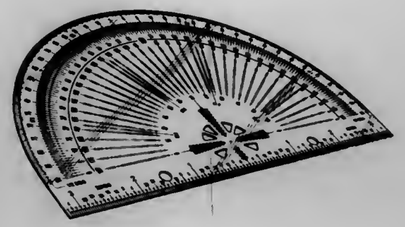
398,864
RULER AND DRAWING TEMPLATE
Charles W. Dietterich, Brodheadsville, Pa.; Stephen A. White, Bloomsbury, N.J.; Brett A. Wilson, Durhan, Pa., and Richard A. Tarozzi, Gales Ferry, Conn., assignors to Binney & Smith Inc., Easton, Pa.
Filed Oct. 20, 1997, Ser. No. 78,129
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—62

398,865
PROTRACTOR AND DRAWING TEMPLATE
Charles W. Dietterich, Broadheadsville, Pa.; Stephen A. White, Bloomsbury, N.J.; Brett A. Wilson, Durham, Pa., and Richard A. Tarozzi, Gales Ferry, Conn., assignors to Binney & Smith Inc., Easton, Pa.
Filed Oct. 20, 1997, Ser. No. 78,136
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—62

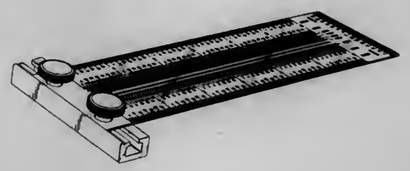


398,866
FREE STYLE SWING GAGE
Steven T. Bidwell, Ellington, Conn., assignor to Bidwell Corporation, Enfield, Conn.
Division of Ser. No. 43,840, Sep. 11, 1995. This application Aug. 27, 1997, Ser. No. 75,812
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—65

398,867
PROTRACTOR
Christopher L. Taylor, Dallas, Tex., assignor to Taylor Design Group, Inc., Carrollton, Tex.
Filed Nov. 26, 1997, Ser. No. 80,039
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—65



398,868
T-RULE
Christopher L. Taylor, Carrollton, Tex., assignor to Taylor Design Group, Inc., Carrollton, Tex.
Filed Nov. 26, 1997, Ser. No. 80,053
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—65



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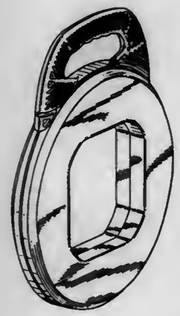
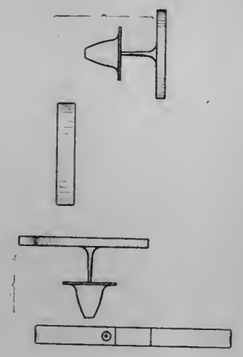
398,869
RULE
Christopher L. Taylor, Dallas, Tex., assignor to Taylor Design Group, Inc., Carrollton, Tex.
Filed Nov. 26, 1997, Ser. No. 80,052
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—71

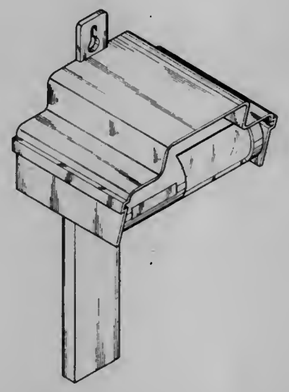
398,870
FISH TAPE
Bruce P. Konen, Aurora, and Jason R. Lieving, Byron, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.
Filed Oct. 7, 1996, Ser. No. 60,788
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—72



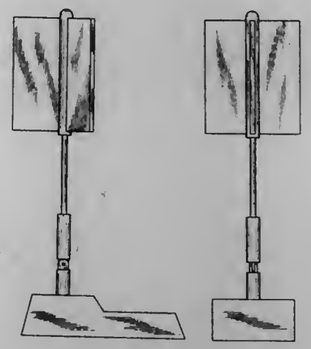
398,871
ANTI-THEFT LUGGAGE ALARM UNIT
Ariyo A. Salami, 5612 Whistler Crescent, Mississauga Ontario L4Z 3R6, Canada
Filed Nov. 13, 1997, Ser. No. 79,408
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—106



398,872
ULTRASONIC ANIMAL EXPELLING UNIT AND PASSIVE INFRARED RAYS DETECTOR
Te-Chin Jan, 24F-1, No. 161, Sung-Teh Rd., Taipei, Taiwan
Filed Sep. 12, 1997, Ser. No. 80,110
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—106



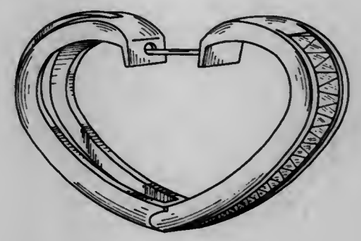
398,873
AIR PROPELLED ROTATION REFLECTOR
Tien Hung Nghe, 39 Convent Rd., Nanuet, N.Y. 10954
Filed Nov. 17, 1997, Ser. No. 79,426
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—109



398,874
ORNAMENTAL CHAIN
Silverio Cerato, Mussolente, Italy, assignor to Silmar S.p.A., Romano D'Ezzelino, Italy
Filed Jun. 16, 1997, Ser. No. 72,372
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—25

398,875
EARRING
Premkumar Kothari, Mumbai, India, assignor to Fine Jewellery (India) Ltd., Andheri (East) Bombay, India
Filed Nov. 29, 1996, Ser. No. 63,171
The portion of the term of this patent subsequent to Mar. 3, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—41

398,876
HEART SHAPED REVERSIBLE EARRING
Ashish Kothari, Bombay, India, assignor to Jewelex New York Ltd., New York, N.Y.
Filed Feb. 5, 1997, Ser. No. 66,116
The portion of the term of this patent subsequent to Mar. 17, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—56



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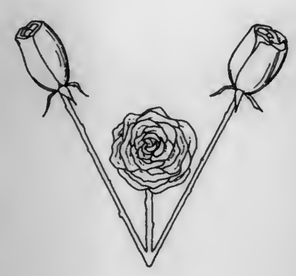
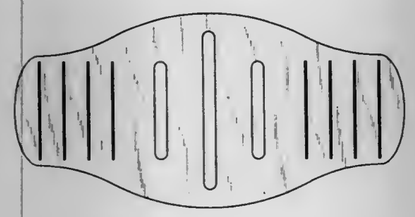
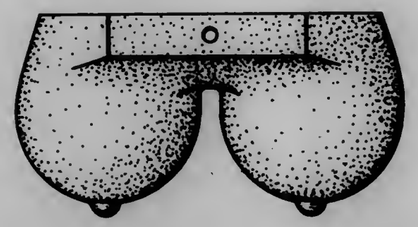
398,877
THREE ROSES JEWELRY PIN
J. D. Hill, and Mardell M. Hill, both of 24618 230th St., Hutchinson, Minn. 55350
Filed Jun. 12, 1997, Ser. No. 72,254
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—63



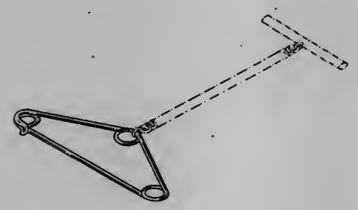
398,878
WATCH BAND JACKET
Whitmer R. Middleton, Sr., 1724 White Water Rd., Lancaster, Pa. 17603
Filed May 16, 1997, Ser. No. 70,827
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—86



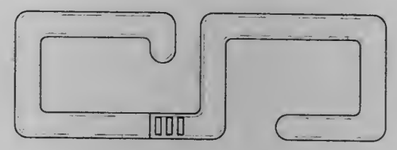
398,879
DECORATIVE BEAD
Alan H. Philipson, and Andre R. Philipson, both of New Orleans, La., assignors to Superior Merchandise Company Inc., New Orleans, La.
Filed Aug. 15, 1997, Ser. No. 75,162
Term of patent 14 years
LOC (6) Cl. 11 - *01*
U.S. Cl. D11—86



398,880
TIE PIN
Joseph Insalaco, 6927 Witmer Rd. #4, North Tonawanda, N.Y. 14120
Filed Apr. 25, 1997, Ser. No. 70,058
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—202

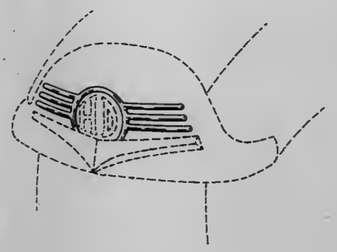


398,881
BRA STRAP CLIP
Nina D. France-Davis, 347 Old White Horse Pike, Waterford, N.J. 08089
Filed Aug. 22, 1997, Ser. No. 75,518
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D11—210



398,882
MOTOR VEHICLE
Robert Powell, Oberschleissheim, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany
Filed Apr. 12, 1996, Ser. No. 53,048
Claims priority, application Germany, Oct. 12, 1995, M 95 08 173.9
Term of patent 14 years
LOC (6) Cl. 12 - *08*
U.S. Cl. D12—88

398,883
FENDERTIP TRIM
William G. Davidson, Delafield, and Raymond W. Drea, Whitefish, both of Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.
Filed Jul. 9, 1997, Ser. No. 73,437
Term of patent 14 years
LOC (6) Cl. 12 - *11*
U.S. Cl. D12—114



398,884
STROLLER
Nathanael Nelson King, Morgantown, and Mark Matthew Messner, Wyomissing, both of Pa., assignors to Graco Children's Products Inc., Eleverson, Pa.
Filed Aug. 13, 1997, Ser. No. 74,928
Term of patent 14 years
LOC (6) Cl. 12 - *12*
U.S. Cl. D12—129

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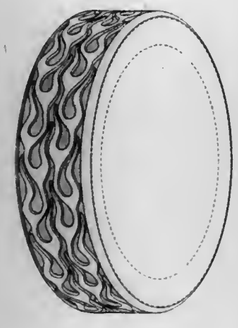
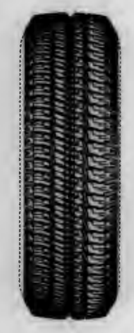
398,885
TIRE TREAD
Billy Joe Ratliff, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 1, 1997, Ser. No. 73,130
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—137

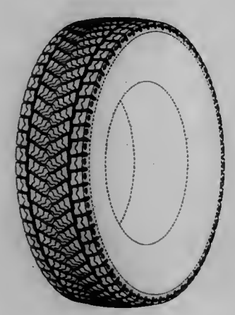


398,886
TIRE TREAD
Stephanie Carol Brown; Billy Joe Ratliff, Jr., both of Akron, and Michael Alois Kolowski, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 2, 1997, Ser. No. 73,086
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146

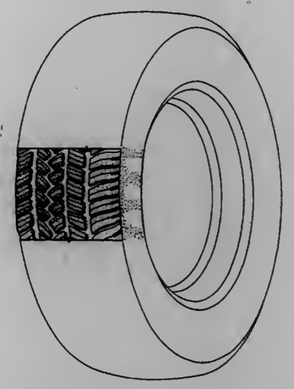


398,887
TIRE TREAD
Stephanie Carol Brown; Billy Joe Ratliff, Jr., both of Akron, and Michael Alois Kolowski, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 2, 1997, Ser. No. 73,087
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146

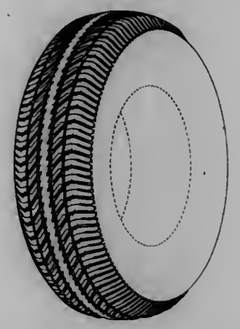
398,888
TIRE TREAD
Olivier de Barsy, Kleinbettingen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 2, 1997, Ser. No. 70,908
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—146



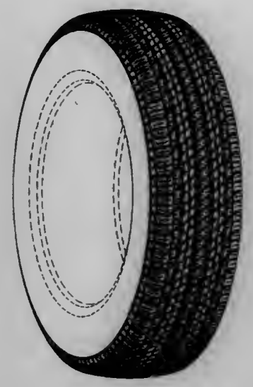
398,889
TIRE
Mark D. Slingluff, North Canton, Ohio, assignor to Continental General Tire, Inc., Akron, Ohio
Filed Nov. 20, 1995, Ser. No. 46,906
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



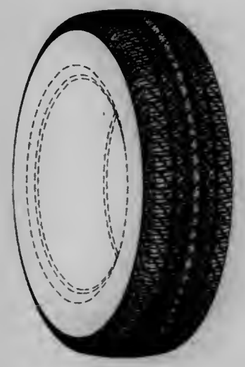
398,890
TIRE TREAD
Pierre Harpes, Luxembourg, Luxembourg, and Richard Heinen, Habay-la-Neuve, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 24, 1997, Ser. No. 66,882
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



398,891
TIRE TREAD
Eileen Ann McKisson, Richfield, Ohio, assignor to Michelin Recherche et Technique S.A., Switzerland
Filed May 22, 1997, Ser. No. 71,161
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



398,892
TIRE TREAD
Ellen MacDonald Williams, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Switzerland
Filed Aug. 1, 1997, Ser. No. 74,355
Term of patent 14 years
LOC (6) Cl. 12 - *15*
U.S. Cl. D12—147



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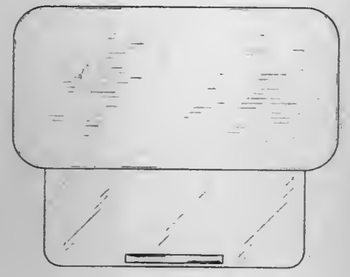
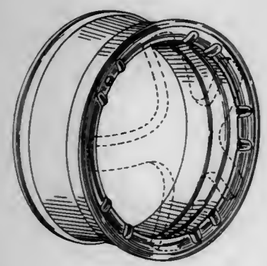
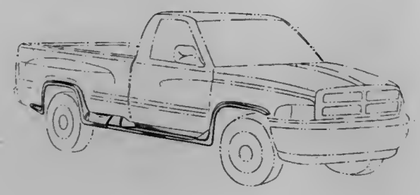
398,893
CLIP-ON SUN VISOR WITH TINTED PLASTIC EXTENSION
Elliott J. Lyons, 2917 Lakewood Ct., Harlingen, Tex. 78550
Filed Jul. 23, 1997, Ser. No. 74,045
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—191



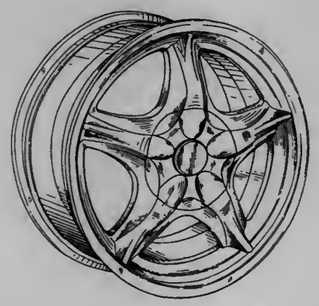
398,894
WHEEL RIM
Steve Kelley, Irvine, Calif., assignor to Wheel Components, Inc., Fullerton, Calif.
Filed Apr. 14, 1997, Ser. No. 68,165
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—208



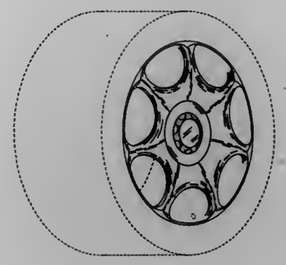
398,895
COMBINED RUNNING BOARD AND FENDER FLARES FOR A VEHICLE
Paul Thomas, Jr., Clayhatchee, Ala., assignor to Tri-Glas Corporation, Daleville, Ala.
Continuation-in-part of Ser. No. 4,316, Feb. 1, 1993. This application Aug. 22, 1994, Ser. No. 27,432
The portion of the term of this patent subsequent to Oct. 8, 2010, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—203



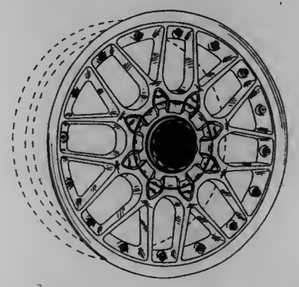
398,896
VEHICLE WHEEL
Suprihanto, Medaeng-Sidoarjo, Indonesia, assignor to PT Prima Alloy Steel Universal, Sidoarjo, Indonesia
Filed Jun. 26, 1996, Ser. No. 56,296
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



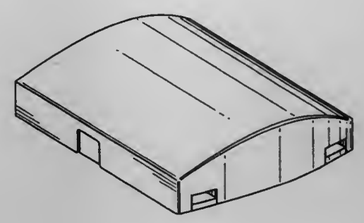
398,897
FRONT FACE OF A VEHICLE WHEEL
Marco Muzzarelli, Milan, Italy, assignor to Claus Ettensberger Corp., Gardena, Calif.
Filed Jun. 13, 1997, Ser. No. 72,039
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



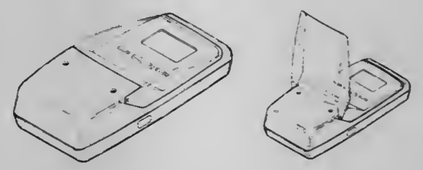
398,898
VEHICLE WHEEL
Heinrich Baumgartner, Schiltach, and Ewald Frick, Alpirsbach, both of Germany, assignors to BBS Kraftfahrzeugtechnik AG, Germany
Filed Nov. 22, 1995, Ser. No. 46,978
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—211



398,899
BATTERY MODULE
John Chaco, Seymour, Conn., assignor to Executone Information Systems, Inc., Milford, Conn.
Filed Sep. 19, 1997, Ser. No. 76,502
Term of patent 14 years
LOC (6) Cl. 13 - *02*
U.S. Cl. D13—103



398,900
CONTROL UNIT FOR IRRIGATION SYSTEMS
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy
Filed Jul. 10, 1997, Ser. No. 73,226
Claims priority, application Italy, Jan. 14, 1997, M197O0026
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—123



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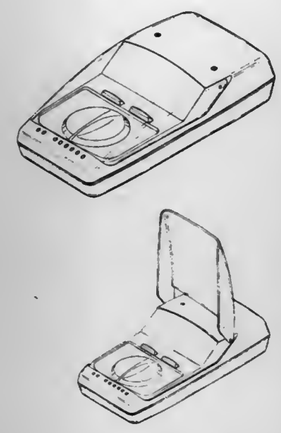
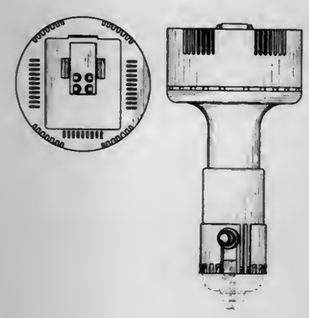
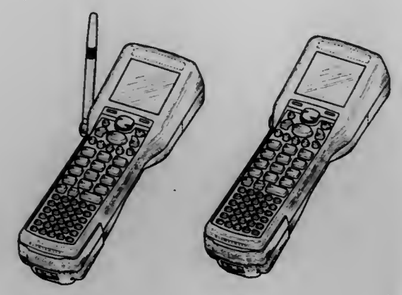
398,901
CONTROL UNIT FOR IRRIGATION SYSTEMS
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy
Filed Jul. 10, 1997, Ser. No. 73,286
Claims priority, application Italy, Jan. 14, 1997, MI97O0026
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—123



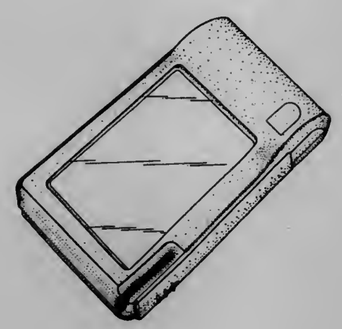
398,902
FLUORESCENT LIGHT ADAPTER
Michael A. Spadafore, Newbury, Mass., assignor to Pacific Scientific Company, Newport Beach, Calif.
Filed Oct. 6, 1995, Ser. No. 45,040
Term of patent 14 years
LOC (6) Cl. 13 - *03*
U.S. Cl. D13—135



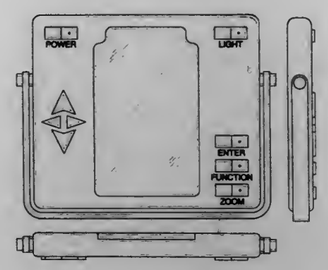
398,903
HAND-HELD COMPUTER
Debbie Chacon, Seattle; Dan Blase, Everett, and James R. Stewart, Woodinville, all of Wash., assignors to Intermec Corporation, Everett, Wash.
Filed Oct. 23, 1996, Ser. No. 61,379
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100



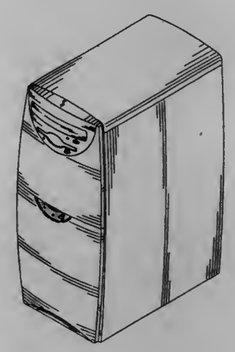
398,904
ELECTRONIC COMPUTER
Hidetoshi Tamaki, and Kunihiro Ohki, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 8, 1997, Ser. No. 73,427
Claims priority, application Japan, Jan. 8, 1997, 9-258
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100



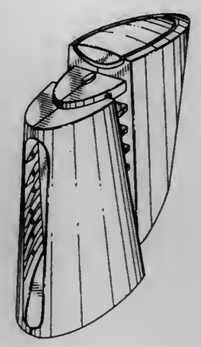
398,905
VIDEO BOOK
Lance R Bergenham, 448 Altoff Rd. Box 1226, Golden BC, Canada, V0A 1H0
Filed Sep. 25, 1997, Ser. No. 77,051
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—100



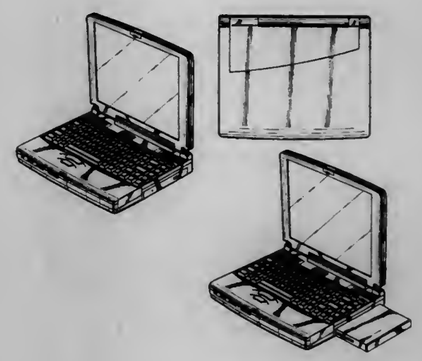
398,906
ENCLOSURE FOR A MINITOWER PERSONAL COMPUTER
Shaun Fynn, West Hollywood, Calif.; Lorrie Vogel, Lake Oswego, Oreg.; Jonathan Scheiner, Topanga, Calif.; Greg Halus, Woodland Hills, Calif.; John Arbak, Ventura, Calif.; David Hoard, Sherman Oaks, Calif.; Stan Wada, Tarzana, Calif.; Phil Smith, Valencia, Calif., and Martin M. Lotti, Frieburg, Switzerland, assignors to Gateway 2000 Inc., North Sioux City, S.C.
Filed Oct. 15, 1996, Ser. No. 61,029
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—102



398,907
COMPUTER HOUSING
Philip Yurkonis, Campbell; Craig Leverault, Mountain View; Herbert H. F. Pfeifer, San Francisco, and Paul Montgomery, Kentfield, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Filed Oct. 28, 1996, Ser. No. 61,634
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—102



398,908
ELECTRONIC COMPUTER
Masaaki Iino, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 10, 1997, Ser. No. 76,585
Claims priority, application Japan, Apr. 1, 1997, 50012/1997
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D15—106



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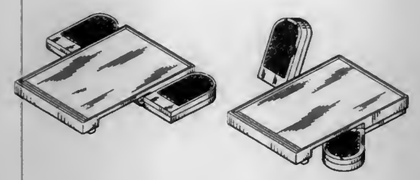
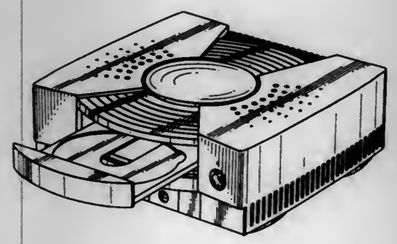
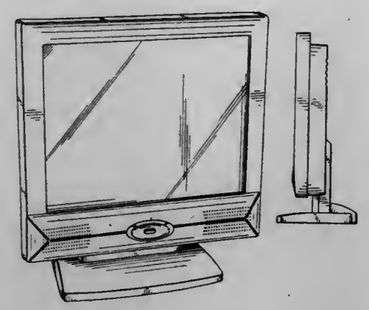
398,909
PORTABLE MULTIMEDIA CD-ROM PLAYER
Kazuhiko Yamazaki, Hiratsuka; Shuichi Iwata, and Shinobu Hashizume, both of Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 4, 1996, Ser. No. 52,755
Claims priority, application Japan, Oct. 9, 1995, 7-30263
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



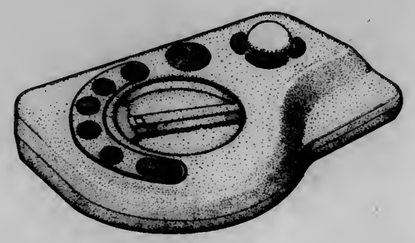
398,910
OPERATION AND CONTROLLING APPARATUS FOR ELECTRIC COMPUTERS WITH AN INFORMATION RECORDING AND REPRODUCING UNIT
Shogo Suzuki, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 66,184, Feb. 6, 1997, abandoned. This application Aug. 27, 1997, Ser. No. 76,298
Claims priority, application Japan, Sep. 26, 1996, 8-28460
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—107



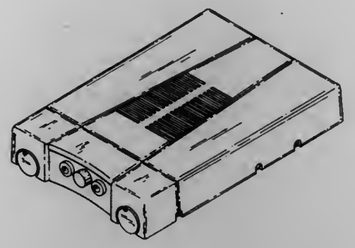
398,911
COMPUTER DISPLAY
Yu-Jing Lin, Taipei, Taiwan, assignor to Compal Electronics, Inc., Taipei, Taiwan
Filed Nov. 7, 1997, Ser. No. 79,964
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



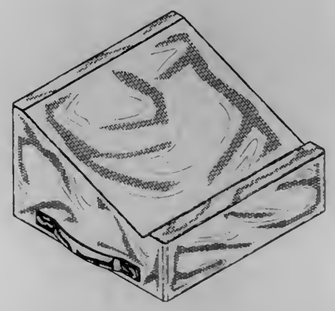
398,912
COMPUTER INPUT DEVICE
Michael E. Phillips, Brookline, Mass., assignor to Avid Technology, Inc., Tewksbury, Mass.
Filed Apr. 10, 1996, Ser. No. 52,941
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



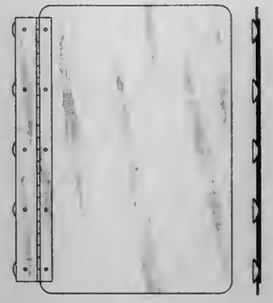
398,913
AUDIO PROCESSING DEVICE FOR MULTIMEDIA
Tonny Tseng, Taipei, Taiwan, assignor to Yosun Industrial Corp., Taipei, Taiwan
Filed May 9, 1997, Ser. No. 70,530
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



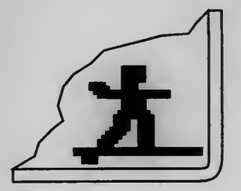
398,914
INFLATABLE LAPTOP SUPPORT
David Pulver, 4860 Vieja Dr., Santa Barbara, Calif. 93110
Filed Jun. 9, 1997, Ser. No. 72,128
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



398,915
GLARE SHIELD
William M. Shaffer, 335 Sterling Ave. A-310, Sharon, Pa. 16146
Filed Sep. 18, 1997, Ser. No. 76,716
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



398,916
PORTION OF A DISPLAY PANEL WITH A SURFING ICON IMAGE
Mark Bernardi, Highland Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Dec. 30, 1995, Ser. No. 49,767
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114.7



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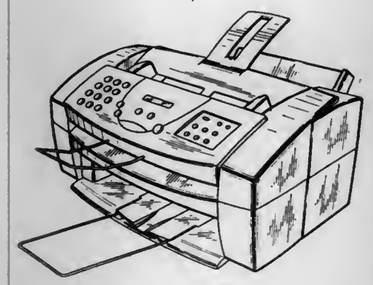
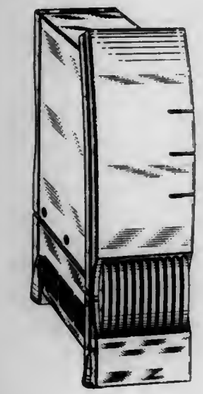
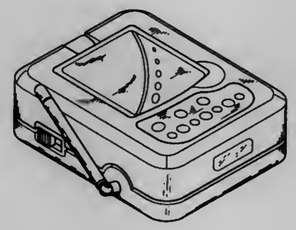
398,917
FACSIMILE TRANSMITTER-RECEIVER CAPABLE OF SERVING AS PHOTOCOPIER
Yasunori Senshiki, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Japan
Filed Oct. 22, 1997, Ser. No. 78,373
Claims priority, application Japan, Apr. 28, 1997, 9-052697
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D14—118



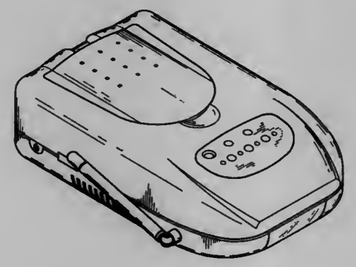
398,918
PROCESSOR FOR A VIDEO EDITING SYSTEM
Jonathan C. Burke, Corte Madera, Calif., assignor to Scitex Digital Video, Inc., Redwood City, Calif.
Filed Apr. 9, 1996, Ser. No. 52,793
Term of patent 14 years
LOC (6) Cl. 02 - *03*
U.S. Cl. D14—124



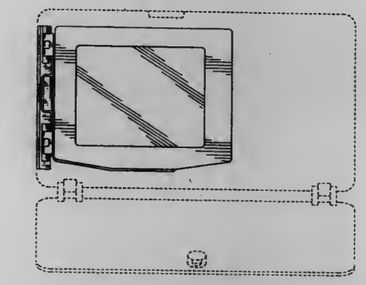
398,919
VIDEO SENDER
Kerl Yen, No. 3, Tzu Chiang I Rd., Chung Li City, Tao Yuan Hsien, Taiwan
Filed Mar. 27, 1997, Ser. No. 69,310
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—125



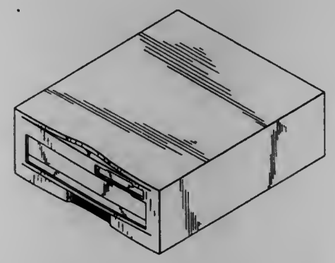
398,920
VIDEO SENDER
Kerl Yen, No. 3, Tzu Chiang I Rd., Chung Li City, Tao Yuan Hsien, Taiwan
Filed Mar. 27, 1997, Ser. No. 69,636
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—125



398,921
DEPLOYABLE MONITOR
John B. Rosen, 87580 Cherry Ridge Rd., Eugene, Oreg. 97402
Filed Aug. 29, 1997, Ser. No. 75,858
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—132

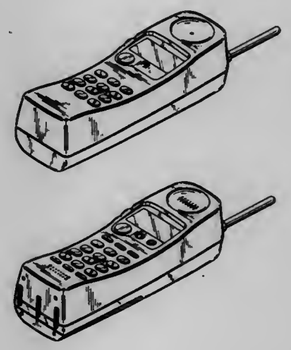


398,922
VIDEO TAPE RECORDER
Toshiyuki Hisatsune, and Tetsu Sumii, both of c/o Sony Corporation, 7-35 Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, Japan
Filed Sep. 4, 1996, Ser. No. 59,719
Claims priority, application Japan, Mar. 5, 1996, 8-5737
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—135



398,923
FRONT SECTION OF A PORTABLE RADIO COMMUNICATION DEVICE
Masaru Tokiyama, Coral Springs, Fla., and Richard A. Ceraldi, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 14, 1996, Ser. No. 62,413
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—137

398,924
WIRELESS TELEPHONE
Koji Shindo, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 30, 1997, Ser. No. 72,781
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



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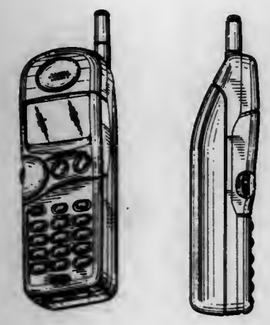
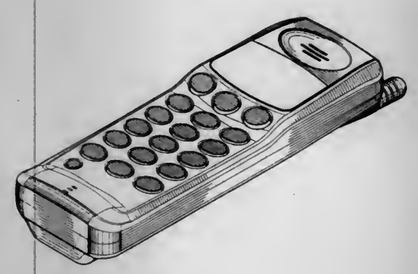
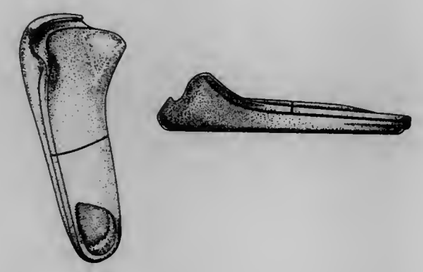
398,925
WIRELESS TELEPHONE
James Wicks, San Francisco, Calif., assignor to Sony Corporation of America, New York, N.Y.
Continuation-in-part of Ser. No. 67,119, Feb. 28, 1997. This application Aug. 13, 1997, Ser. No. 74,936
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



398,926
RADIOTELEPHONE HOUSING
Phillip Edward Lindeman, Gurnee; Steven M. Mina, Lake Villa, and Thomas E. Paulick, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 59,704, Aug. 21, 1996, Pat. No. Des. 390,222. This application Sep. 9, 1997, Ser. No. 80,111
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138

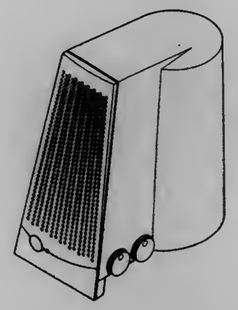


398,927
TELEPHONE BASE STATION
Clifford Dean Read, Stittsville; Pak Jong Chu, Nepean, and Andre John Van Schyndel, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 28, 1995, Ser. No. 44,814
Term of patent 14 years
U.S. Cl. D14—149

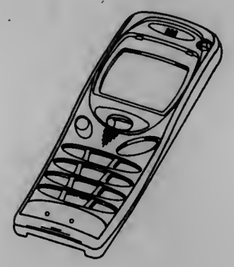


398,928
FIELD CD BOOMBOX
Tjeerd Dijkstra, Leiderdorp, Netherlands, assignor to Pollyflame International B.V., Roelofrendsveen, Netherlands
Filed Jul. 8, 1997, Ser. No. 73,956
Claims priority, application WIPO, Jan. 8, 1997, DM/038745
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—188

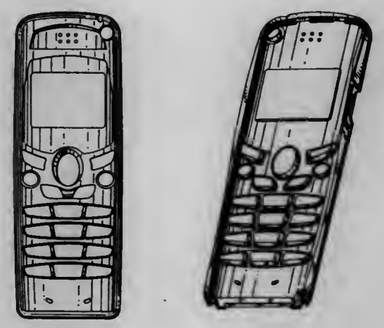
398,929
CABINET FOR LOUDSPEAKER
Ming-Li Chu, Taipei, Taiwan, assignor to Mag Technology Co., Ltd., Taipei, Taiwan
Filed Aug. 26, 1996, Ser. No. 73,322
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—211



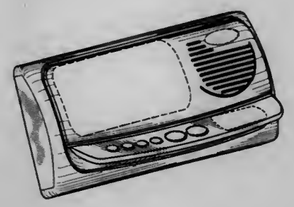
398,930
COVER OF A TELEPHONE HANDSET
Frank Nuovo, Los Angeles; Gregor Magnusson, Thousand Oaks; Andy Vong, Venice, and Sheldon Phillips, Agoura, all of Calif., assignors to Nokia Mobile Phones Limited, Espoo, Finland
Filed Feb. 21, 1997, Ser. No. 66,783
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—250



398,931
FRONT COVER FOR A TELEPHONE HANDSET
Frank Nuovo, Los Angeles; Sheldon Phillips, Agoura, both of Calif., and Jan Kettula, Turku, Finland, assignors to Nokia Mobile Phones Limited, Espoo, Finland
Filed Jun. 6, 1997, Ser. No. 71,810
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—250



398,932
FRONT PANEL FOR A RADIO BASE STATION
Masaru Tokiyama, Coral Springs, Fla.; Richard A. Ceraldi, Austin, Tex.; James H. Blomquist, Jr., Bolingbrook, and Charles R. Allison, III, Lake Zurich, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 3, 1997, Ser. No. 66,045
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—257



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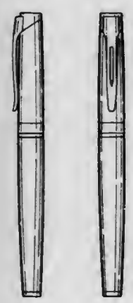
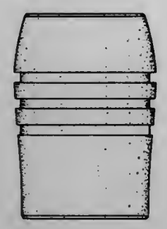
398,933
PAIR OF EYEWEAR LENSES
Mark J. Flanagan, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Division of Ser. No. 46,672, Oct. 20, 1995, Pat. No. Des. 381,345. This application Jul. 10, 1996, Ser. No. 56,873
Term of patent 14 years
LOC (6) Cl. 16 - *06*
U.S. Cl. D16—326

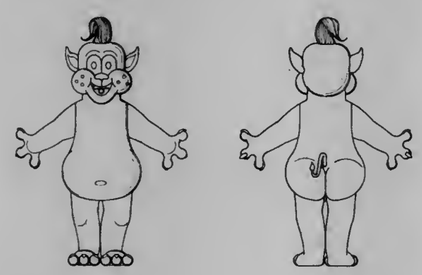
398,934
PEN
Jean Veillon, Sainte Etienne de Montluc, France, assignor to Waterman S.A., Paris, France
Filed Aug. 20, 1996, Ser. No. 58,667
Claims priority, application WIPO, Mar. 11, 1996, DM 035811
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—51



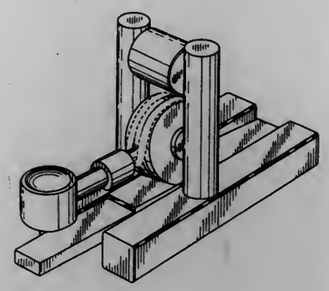
398,935
WRITING INSTRUMENT FERRULE
Jean Francois Chevalier, Paris, France, assignor to Conte S.A., Boulogne sur Mer, France
Filed May 30, 1997, Ser. No. 71,580
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—58



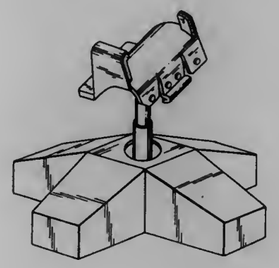
398,936
BUBBLE BLOWING DOLL
Xavier Blackwell, 45 Bay 28th St. #C-4, Brooklyn, N.Y. 11224
Filed Sep. 30, 1997, Ser. No. 77,348
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—61



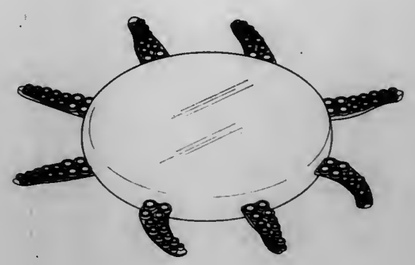
398,937
CATAPULT TOY
Michael D. Spikes, 505 SE. Vera, Corvallis, Oreg. 97333
Filed Jun. 30, 1997, Ser. No. 73,095
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—2



398,938
HAND CONTROLLER FOR VIDEO GAME
Keith E. Thurston, 4 Rhapsody Lane, Ottawa, Ontario, Canada, K1V 1B1, and Kenneth G. Thurston, 2711, Pimlico Crescent, Gloucester, Ontario, Canada, K1T 2A7
Filed Apr. 3, 1997, Ser. No. 68,337
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—48



398,939
DISC-SHAPED FLYER HAVING OCTOPUS-LIKE TENTACLES
William D. Harned, 7537 Scenic View Dr., Knoxville, Tenn. 37938
Filed Jul. 31, 1997, Ser. No. 74,201
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—86



398,940
COCKATOO JIGSAW PUZZLE SCULPTURE
Ofer Nissim, Pound Ridge, N.Y., and Suzanne Simpson, Greenwich, Conn., assignors to Knox Security Engineering Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 50,557, Dec. 19, 1995. This application May 9, 1996, Ser. No. 54,280
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—104

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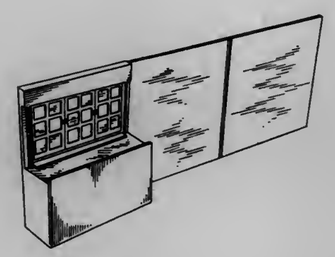
398,941
BIRD OF PARADISE JIGSAW PUZZLE SCULPTURE
Ofer Nissim, Pound Ridge, N.Y., and Suzanne Simpson, Greenwich, Conn., assignors to Knox Security Engineering Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 50,554, Dec. 19, 1995. This application May 9, 1996, Ser. No. 54,285
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—104

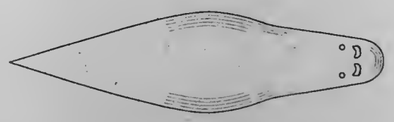
398,942
SUN PARAKEET JIGSAW PUZZLE SCULPTURE
Ofer Nissim, Pound Ridge, N.Y., and Suzanne Simpson, Greenwich, Conn., assignors to Knox Security Engineering Corporation, Stamford, Conn.
Filed May 14, 1996, Ser. No. 54,420
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—104

398,943
SCHOOL PLAYSET WITH PANELS FOR DECORATION
Allison Katzman, Evanston; Randall Jon Klimpert, Wilmette; Dianne Elizabeth Lauble, Chicago; Michael John Lichodzicjewski, Schaumburg; Craig Dennis Sellers, and Paula Yurkovic, both of Chicago, all of Ill., assignors to Meyer/Glass Design, Ltd., Chicago, Ill.
Filed Jul. 11, 1997, Ser. No. 73,382
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—109

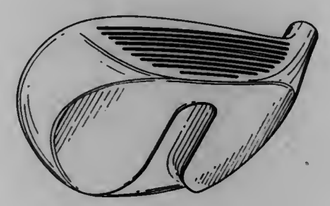


398,944
TOY EXCAVATOR
Ken Park, Northville, Mich., assignor to New Bright Industrial Co., Ltd., Kowloon, Hong Kong
Filed Apr. 28, 1997, Ser. No. 70,075
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—131

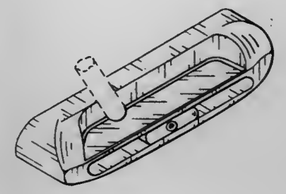
398,945
STUFFED TOY SLUG
Sharon Patten Russell, 109 Chestnut Dr., Marion, Ark. 72364-2039
Filed Mar. 4, 1997, Ser. No. 67,503
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—185



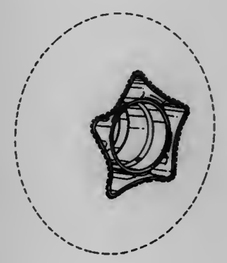
398,946
HEAD OF GOLF CLUB
Yoshinari Kenmi, Kobeshi, Japan, assignor to Royal Collection Incorporated, Kobeshi, Japan
Filed Oct. 7, 1994, Ser. No. 26,936
Claims priority, application Japan, Sep. 7, 1994, 6-27271
The portion of the term of this patent subsequent to Oct. 31, 2009, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—214



398,947
GOLF PUTTER CLUB HEAD
Brice R. Holladay, 741 Old Hickory Rd., Jacksonville, Fla. 32207, and Richard B. Hendrickson, 8335 Freedom Crossing Trail, #4201, Jacksonville, Fla. 32256
Filed Feb. 21, 1997, Ser. No. 66,930
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—217



398,948
CENTER PORTION OF A WHEEL HUB
Scott Portzline, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Division of Ser. No. 68,416, Apr. 3, 1997. This application Sep. 17, 1997, Ser. No. 77,144
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—764



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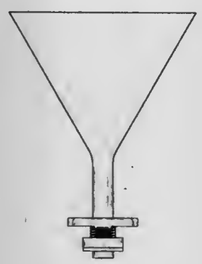
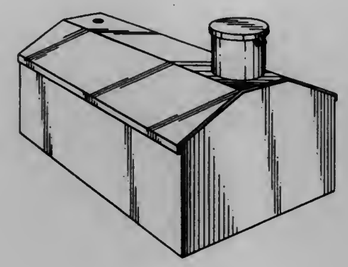
398,949
GUN AND SHELL HOLDER
M. Kerry Franks, 947 Adams Rd., West Point, Ga. 31833
Filed Jul. 29, 1997, Ser. No. 74,226
Term of patent 14 years
LOC (6) Cl. 22 - *01*
U.S. Cl. D22—108

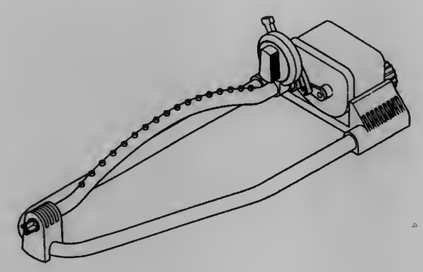
398,950
ATTACHING FUNNEL
Ronald S. Keefer, 279 Rt e. 31 South, Washington, N.J. 07882, and John Sickle, 186 Shepherd Ave., Middlesex, N.J. 08846
Filed Jul. 10, 1997, Ser. No. 73,389
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—200



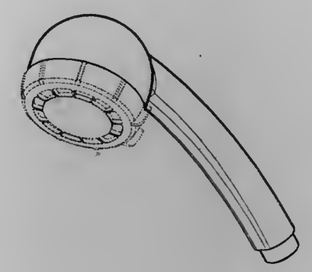
398,951
TANK CONTAINER
Patrick Albert Young, Box 39, Monte Lake, British Columbia, Canada, V0E 2N0
Filed May 15, 1997, Ser. No. 70,847
Claims priority, application Canada, Nov. 15, 1996, 1996-2607
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—202



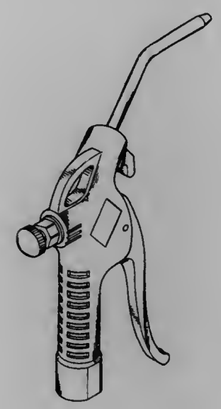
398,952
SPRINKLER
Mei-Hsueh Hsueh, No. 10, Fang Tung Rd., Wen Chin Village, Fang Yuan Hsiang, Chang Hua County, Taiwan
Filed Oct. 27, 1997, Ser. No. 78,506
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—216



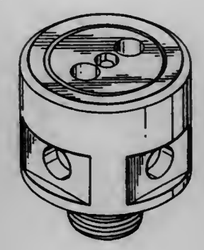
398,953
HAND HELD SHOWERHEAD
Leonard C. Andrus, Plymouth; Ronald D. Green, New Hudson, and Bruce Higgins, South Lyon, all of Mich., assignors to Brass-Craft Manufacturing Company, Novi, Mich.
Filed May 29, 1997, Ser. No. 71,412
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—223



398,954
SPRAY GUN
Wuu-Cheau Jou, No. 95, Cheng Kung 2nd Road, Tali City, Taichung Hsien, Taiwan
Filed Jan. 16, 1998, Ser. No. 82,217
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—226



398,955
PRESSURE VALVE
Tatsuo Shimizu, c/o Sony Enegytec Inc., 1-1 Aza, Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, Japan
Filed Mar. 26, 1996, Ser. No. 52,192
Claims priority, application Japan, Sep. 27, 1995, 7-28795
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—235



398,956
FAUCET
Francois Kergoet, Malakoff, France, assignor to Jacob Delafon, Paris, France
Filed Nov. 3, 1995, Ser. No. 45,956
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—238

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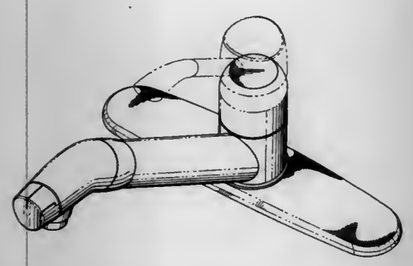
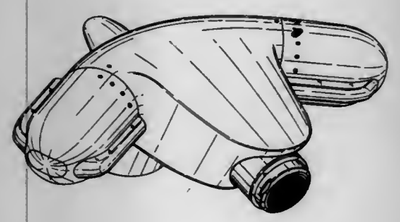
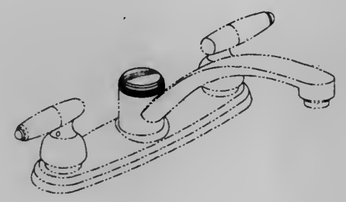
398,957
FAUCET BODY AND SPOUT
Frederic C. Doughty, South Pasadena; Darren M. Mark, Valencia, and Alvin Tolosa, Ventura, all of Calif., assignors to Emhart Inc., Newark, Del.
Filed Dec. 2, 1997, Ser. No. 80,169
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—238



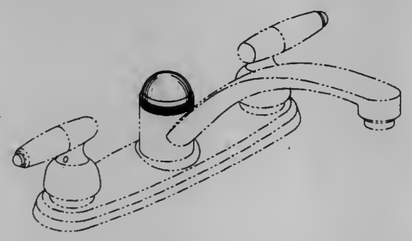
398,958
BIDET FAUCET
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe AG, Hemer, Germany
Filed May 13, 1997, Ser. No. 70,655
Claims priority, application Germany, Nov. 19, 1996, M 96 09 977.1
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—241



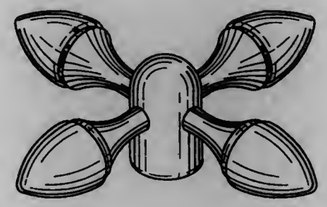
398,959
TWO HANDLE FAUCET SPOUT CAP
Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.
Filed Aug. 22, 1997, Ser. No. 75,754
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—249



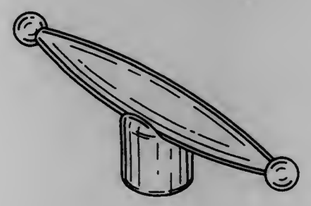
398,960
TWO HANDLE FAUCET SPOUT CAP
Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.
Filed Aug. 22, 1997, Ser. No. 75,779
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—249



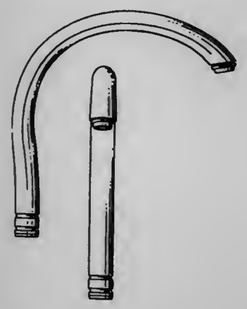
398,961
HANDLE FOR A PLUMBING FITTING
Jill E. Hundley, and Mary J. Reid, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 49,424, Jan. 24, 1996, Pat. No. Des. 385,952. This application May 29, 1997, Ser. No. 71,852
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—250



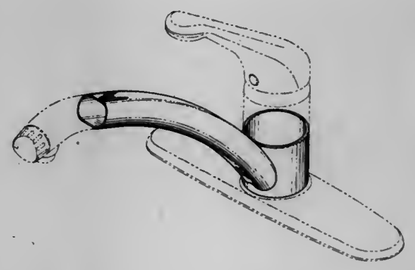
398,962
HANDLE FOR PLUMBING FITTING
Jill E. Hundley; Mary J. Reid, and Thomas A. Bonnell, all of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 49,416, Jan. 24, 1996, Pat. No. Des. 385,953. This application May 29, 1997, Ser. No. 71,853
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—252



398,963
FAUCET SPOUT
Mark E. Donahue, Richmond; Carolyn J. Duffield, Elyria; Vance M. Johnson, Amherst; James J. McElroy, Westlake, and Nagib Nasr, Parma Heights, all of Ohio, assignors to Moen Incorporated, North Olmsted, Ohio
Continuation-in-part of Ser. No. 63,511, Dec. 9, 1996, Pat. No. Des. 387,133. This application Jul. 24, 1997, Ser. No. 74,254
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—255



398,964
SPOUT
Frederic C. Doughty, South Pasadena; Darren M. Mark, Valencia, and Alvin Tolosa, Ventura, all of Calif., assignors to Emhart Inc., Newark, Del.
Filed Oct. 23, 1997, Ser. No. 78,262
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—255



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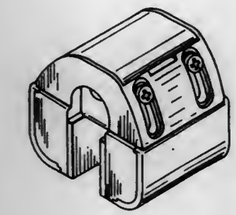
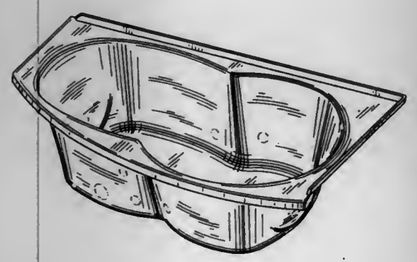
398,965
WATER IMPROVEMENT APPLIANCE
Isamu Masuda, Fukuoka, Japan, assignor to Nihon Kenko Zoushin Kenkyukai Corporation, Fukuoka, Japan
Filed Dec. 24, 1996, Ser. No. 64,293
Claims priority, application Japan, Oct. 31, 1996, 8-33308
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—259

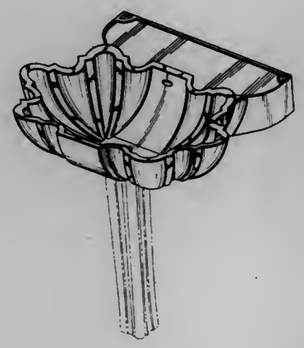


398,966
TUB FOR BATHING
Anna-Pia K. Formgren, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 21, 1997, Ser. No. 65,336
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—277

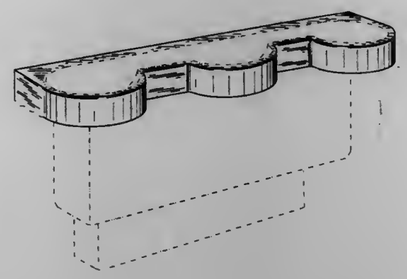


398,967
LAVATORY
Herbert V. Kohler, Jr., Kohler; Mary J. Reid, Sheboygan; Theresa J. Millard, and James M. Neiman, both of Sheboygan Falls, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 24, 1996, Ser. No. 49,419
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—284

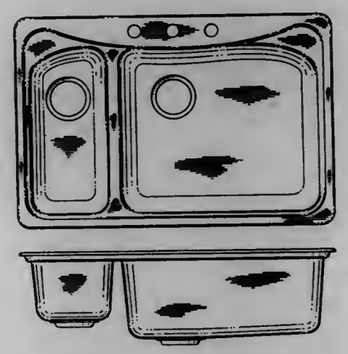
398,968
SINK
Sherle Wagner, 1050 Fifth Ave. Apt. 17D, New York, N.Y. 10128
Division of Ser. No. 52,255, Mar. 26, 1996, Pat. No. Des. 386,248. This application Mar. 19, 1997, Ser. No. 69,055
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—285



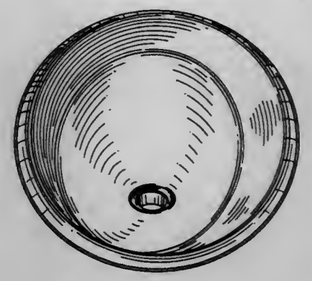
398,969
MULTI-LAVATORY
Thomas G. Barnum, Fox Point, Wis., and Jon W. Hauser, II, Geneva, Ill., assignors to Bradley Corporation, Menomonee Falls, Wis.
Continuation of Ser. No. 610,807, Mar. 7, 1996, Pat. No. 5,611,093, which is a continuation of Ser. No. 324,165, Oct. 14, 1994, abandoned, which is a continuation of Ser. No. 63,278, May 18, 1993, Pat. No. 5,369,818. This application Dec. 23, 1996, Ser. No. 64,125
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—280



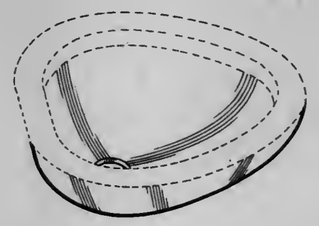
398,970
KITCHEN SINK
Harold B. Gardner, Bay Village; Terry M. Birchler, and Paul P. Kolada, both of Bexley, all of Ohio, assignors to Moen Incorporated, North Olmsted, Ohio
Division of Ser. No. 47,692, Dec. 11, 1995. This application Mar. 7, 1997, Ser. No. 67,244
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—290



398,971
LAVATORY
William C. McKeone, Sheboygan; Theresa J. Millard, Sheboygan Falls, and Herbert V. Kohler, Jr., Kohler, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed May 2, 1996, Ser. No. 53,926
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—293.1



398,972
TOLIET BOWL
Bryan S. Klimek, Overland Park, Kans., and John D. Inch, Kansas City, Mo., assignors to Metcraft, Inc., Grandview, Mo.
Filed Feb. 21, 1997, Ser. No. 66,821
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—295



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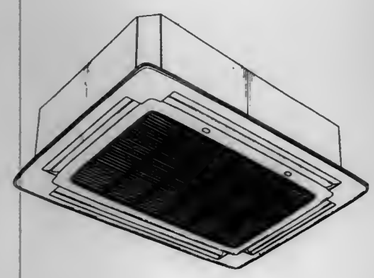
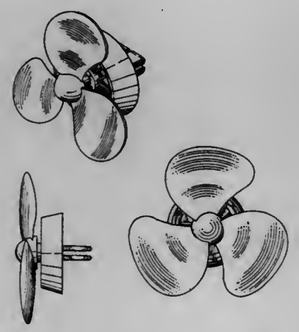
398,973
TRAINING URINAL
Linda J. White, 8006 Gillete, Lenexa, Kans. 66215
Filed May 5, 1997, Ser. No. 70,280
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—302

398,974
AIR CONDITIONER
Sanae Aihara, Yokohama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 52,823, Apr. 9, 1996, abandoned. This application Jun. 3, 1997, Ser. No. 72,870
Claims priority, application Japan, Oct. 11, 1995, 7-30330
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—351

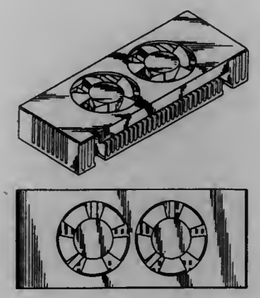


398,975
SUPPLY AIR DEVICE
Bernt Nystrom, Huddinge, Sweden, assignor to Air Innovation Sweden AB, Sweden
Division of Ser. No. 63,945, Dec. 19, 1996, Pat. No. Des. 392,030. This application Nov. 14, 1997, Ser. No. 79,579
Claims priority, application Sweden, Jun. 20, 1996, 96-1413
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—355

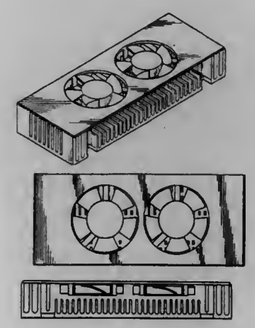
398,976
PROPELLER AIR FRESHENER
Dennis E. Green, 102 Falcon Hills Dr., Highlands Ranch, Colo. 80126
Division of Ser. No. 48,684, Jan. 11, 1996, Pat. No. Des. 385,344. This application Aug. 21, 1997, Ser. No. 75,591
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—367



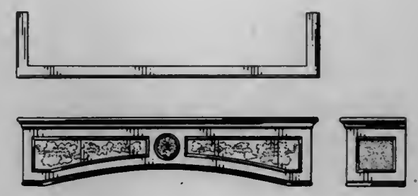
398,977
HEAT DISSIPATION FAN
Alex Horng, Kaohsiung, Taiwan, assignor to Sunonwealth Electric Machine Industry Co., Ltd., Taipei, Taiwan
Filed Oct. 7, 1997, Ser. No. 77,730
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—370



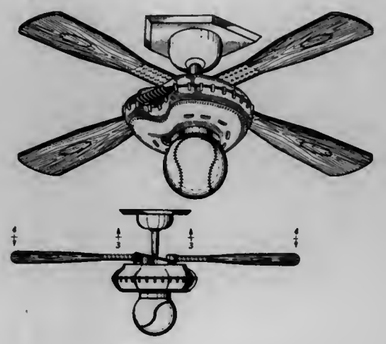
398,978
HEAT DISSIPATION FANS
Alex Horng, Kaohsiung, Taiwan, assignor to Sunonwealth Electric Machine Industry Co., Ltd., Taipei, Taiwan
Filed Oct. 7, 1997, Ser. No. 77,731
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—370



398,979
COOKTOP EXHAUST HOOD
Michael DeGiulio, 605 Linden, Wilmette, Ill. 60091
Filed Jul. 9, 1996, Ser. No. 56,767
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—372



398,980
COMBINED CEILING FAN AND LIGHT KIT
Richard A. Pearce, 4039 Sandberg St., Memphis, Tenn. 38128
Filed Dec. 23, 1994, Ser. No. 32,705
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—377



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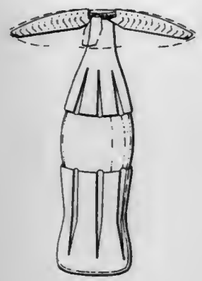
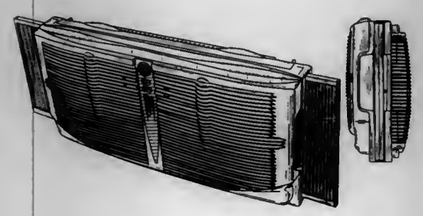
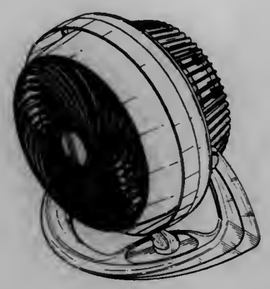
398,981
BOTTLE SHAPED BATTERY OPERATED FAN
Phil A. Wenzell, 561 Pine Valley Dr., Marietta, Ga. 30067
Filed Jun. 10, 1996, Ser. No. 55,675
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—377



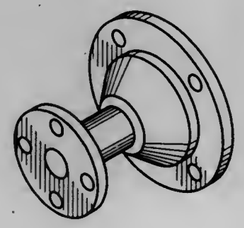
398,982
WINDOW FAN
Rodney Jané , Westboro; Diane Allen, Marlborough, both of Mass.; Jui-Shang Wang, Taipei, Taiwan, and Robert Marvin, Farmington, Conn., assignors to Honeywell Consumer Products, Inc., Southborough, Mass.
Filed Jan. 16, 1996, Ser. No. 48,732
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—380



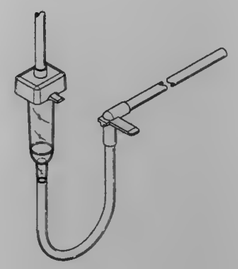
398,983
FAN
Kevin E. Keller, Wichita; Glen W. Ediger, N. Newton; Gary P. Israel, Andover, and Dustan L. Hahn, Derby, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Andover, Kans.
Filed Aug. 8, 1997, Ser. No. 74,622
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—382



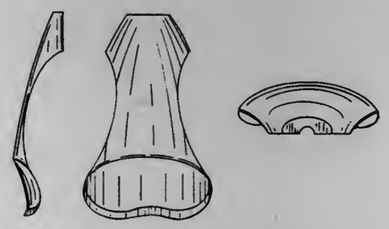
398,984
FAN ADAPTER FOR AUTOMOBILE FAN CLUTCH REPLACEMENT
Eric D. Freeman, 2425 McLean Rd., Charlotte, N.C. 28213
Filed Nov. 25, 1996, Ser. No. 63,045
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—411



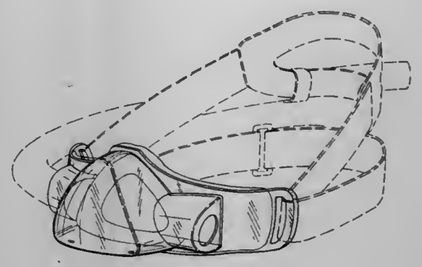
398,985
FLUID DELIVERY SET
Carl Joseph Piontek, Powell; Robert Donald Clegg, Pickerington; Bradford Lynn Buck, Gahanna; Matthew Scott Fleming, Columbus; Grant Richard Wilson, Columbus, and William Edward Patton, Columbus, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Sep. 21, 1995, Ser. No. 44,273
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D24—108



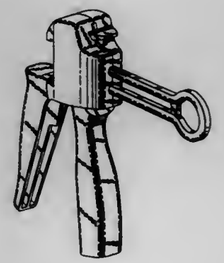
398,986
HANDLE INTERFACE FOR STEERABLE CATHETER
Phillip Jack Snoke, Atlanta; David Scott Rowley, Smyrna, both of Ga., and Thomas Scott Klinker, Chruchville, Pa., assignors to Catheter Imaging Systems, Inc., Atlanta, Ga.
Continuation-in-part of Ser. No. 46,932, Nov. 21, 1995. This application Jan. 16, 1996, Ser. No. 48,899
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—112



398,987
AIR MASK
Ronald L. Cotner, Derry, and Thomas E. Asacker, Exeter, both of N.H., assignors to SleepNet Corporation, Manchester, N.H.
Filed Oct. 31, 1996, Ser. No. 61,892
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D24—110.4



398,988
CARTRIDGE DISPENSER
James E. Nash, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.
Filed Feb. 27, 1995, Ser. No. 35,390
Term of patent 14 years
LOC (6) Cl. 29 - *02*
U.S. Cl. D24—113



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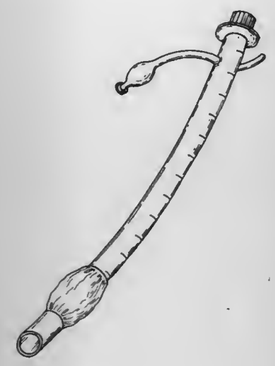
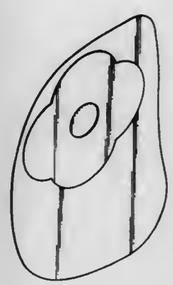
398,989
ENDOTRACHEAL TUBE
Grant Harris Ashlin, 1512 SE. 9th St., Fort Lauderdale, Fla. 33316
Filed Aug. 20, 1997, Ser. No. 75,337
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—115

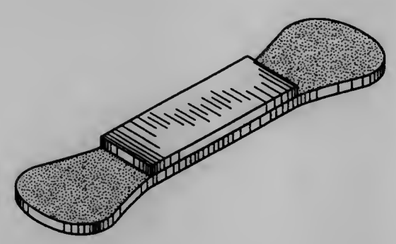


398,990
STOMA BAG
Peter James Briggs, Lancing, and Janet Marie McMeekin, Worthing, both of England, assignors to Smiths Industries PLC, London, England
Filed Apr. 22, 1997, Ser. No. 69,504
Claims priority, application United Kingdom, Nov. 14, 1996, 2060982
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—118

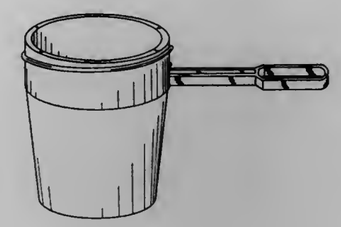


398,991
STOMA BAG
Peter James Briggs, Lancing, and Janet Marie McMeekin, Worthing, both of Great Britain, assignors to Smiths Industries PLC, London, England
Filed Apr. 22, 1997, Ser. No. 69,505
Claims priority, application United Kingdom, Nov. 14, 1996, 2060981
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—118

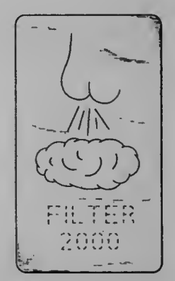
398,992
NASAL INHALER
Ronald M. Feret, Bartlett, Tenn., assignor to Schering-Plough HealthCare Products, Inc., Memphis, Tenn.
Continuation of Ser. No. 56,361, Jun. 27, 1996, abandoned. This application Oct. 21, 1997, Ser. No. 78,326
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—119



398,993
SPECIMEN CUP
Timothy B. Jones, 3525 Huntsman Ct., Edmond, Okla. 73003
Filed Jul. 10, 1997, Ser. No. 73,452
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—122

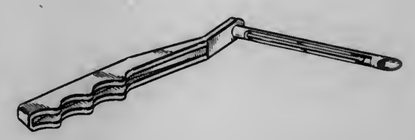


398,994
HUMAN GAS FILTER PAD FOR WEARING IN THE UNDERWEAR
Michael J. Welch, 42 Cottage St., Wilmington, Mass. 01884
Filed Apr. 29, 1997, Ser. No. 70,095
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—124



398,995
TISSUE ABLATION DEVICE
Peter H. Muller, Los Gatos; Rick T. Smethers, Fremont, and David Rapp, Mountain View, all of Calif., assignors to Somus Medical Technologies, Inc., Sunnyvale, Calif.
Filed Jul. 24, 1997, Ser. No. 74,855
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—133

398,996
THREADED SCREW CANNULA
Ricardo J. Simmons, Franklin, Mass.; Rebecca A. Blough, Lincoln, R.I., and Donald J. Fournier, North Providence, R.I., assignors to Smith & Nephew, Inc., Memphis, Tenn.
Continuation of Ser. No. 28,696, Sep. 20, 1994. This application Feb. 27, 1997, Ser. No. 67,417
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—140



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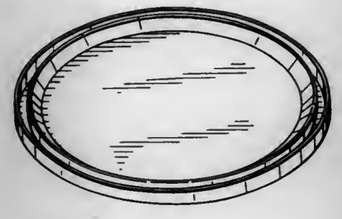
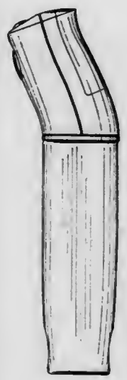
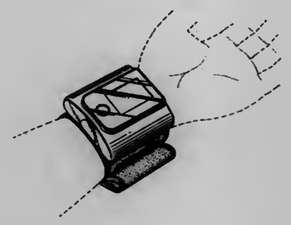
398,997
BASE PART FOR A LIQUID HEATING VESSEL
John Crawshaw Taylor, Castletown, Isle of Man, assignor to Strix Limited, Ronaldsway, Isle of Man
Filed May 21, 1996, Ser. No. 54,785
Claims priority, application United Kingdom, Nov. 22, 1995, 2052183
Term of patent 14 years
LOC (6) Cl. 23 - *99*
U.S. Cl. D23—499



398,998
POWDERED EXTERNAL VACUUM APPLICANCE FOR THE TREATMENT OF IMPOTENCE
Steven C. Gamper, Atlanta; David S. Rowley, Smyrna; Stephen J. Flynn, Peachtree City; Devin L. Moore, Decatur; John A. McMillan, Atlanta; John M. Mitchell, Martinez, and Maureen Carroll, Atlanta, all of Ga., assignors to Osbon Medical Systems, Ltd., Augusta, Ga.
Filed Apr. 25, 1996, Ser. No. 53,584
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—143

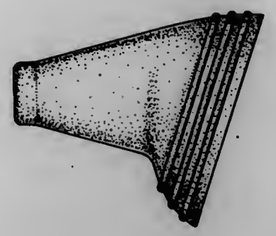


398,999
SPHYGMOMANOMETER
Yasunari Maeda, Düsseldorf, Germany, and Maki Hirakawa, Osaka-fu, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Oct. 14, 1997, Ser. No. 77,827
Claims priority, application Japan, Apr. 11, 1997, 9-51070
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—165

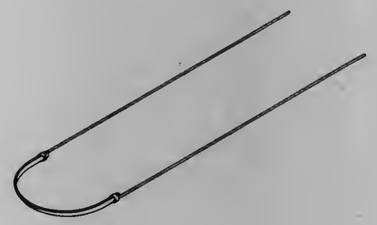


399,000
VEST FOR CARDIOPULMONARY RESUSCITATION AND ASSIST
Neil S. Rothman, and Mark Gelfand, both of Baltimore, Md., assignors to CardioLogic Systems, Inc., Hanover, Md.
Filed Mar. 11, 1997, Ser. No. 67,539
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—167

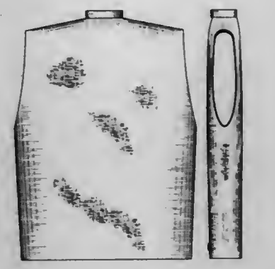
399,001
ADAPTER FOR HEARING AID
Isao Yabe; Akira Yanagisawa, both of Saitama, and Toshibumi Wakayama, Tokyo, all of Japan, assignors to Citizen Tokei Kabushiki Kaisha, Tokyo; Sayama Seimitsu Kogyo Kabushiki Kaisha, Saitama, and Nippon Eurotec Kabushiki Kaisha, Tokyo, all of Japan
Filed Sep. 18, 1997, Ser. No. 76,330
Term of patent 14 years
LOC (6) Cl. 24 - *99*
U.S. Cl. D24—174



399,002
RETAINING DEVICE FOR MAINTAINING CORRECTED DENTITION
Kunio Chikami, 211-1, Minamikuma, Kochi-shi, Kochi-ken, Japan
Filed Mar. 7, 1996, Ser. No. 51,258
Claims priority, application Japan, Feb. 15, 1996, 8-3958
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—180



399,003
SHOWER VEST FOR PROTECTING INTRAVENOUS SITES AND DRESSINGS
Fredricka Hall, 11822 Moon Mist, Houston, Tex. 77072, and Trula R. Booker, 3311 Overcross, Houston, Tex. 77045
Filed Sep. 23, 1996, Ser. No. 60,133
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—190



399,004
NURSER HOOD
Jean L. Johansen, Reedsburg; Timothy R. Roush, Rockford; Mark A. Gilbertson, Sauk City; John W. Grosz, Columbus, and Brenda J. Meyers, Reedsburg, all of Wis., assignors to Gerber Products Company, Fremont, Mich.
Filed Jul. 17, 1997, Ser. No. 73,793
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—193

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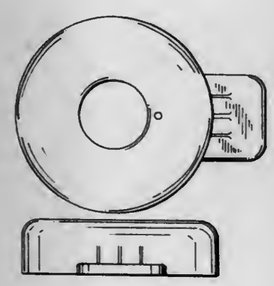
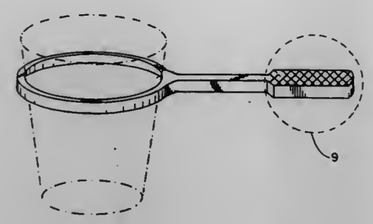
399,005
NURSING BOTTLE
Edwin Chan, Brooklyn, N.Y.; Mari H. Ando, Stamford, Conn., and Thomas M. Dair, Yorktown Heights, N.Y., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.
Filed Aug. 9, 1996, Ser. No. 58,250
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—197

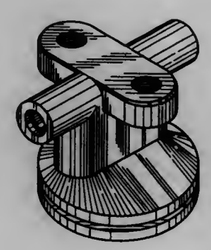
399,006
TEAT CAP FOR A BOTTLE
Mark Alexander Jenkins, Pine Road, R D 5, Feilding, New Zealand
Filed Dec. 4, 1996, Ser. No. 62,923
Claims priority, application New Zealand, Jun. 4, 1996, 27640
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D24—197



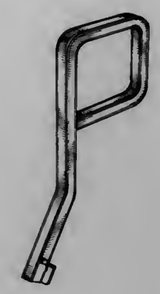
399,007
SPECIMEN CUP HOLDER
Timothy B. Jones, 2517 E. Sweetbriar, Edmond, Okla. 73034; Robert D. Jones, and Lori D. Jones, both of 4612 Stable Dr., Norman, Okla. 73072
Filed Nov. 29, 1996, Ser. No. 63,161
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—227



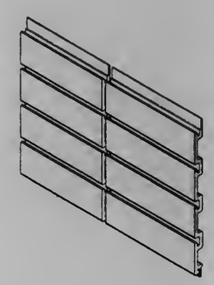
399,008
MANIFOLD CONNECTOR
Glenn E. Thomas, Louisville, Ky., assignor to Chromatography Research Supplies, Inc., Addison, Ill.
Filed Nov. 12, 1996, Ser. No. 62,296
Term of patent 14 years
LOC (6) Cl. 24 - *99*
U.S. Cl. D24—232



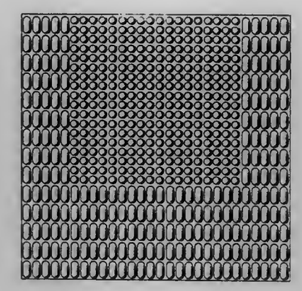
399,009
HANDRAIL
Daniel R. Victor, Kalamazoo; Stanley W. McKay, Richland; Melvin J. Guiles, Plainwell, and Kenneth A. Ahrens, Schoolcraft, all of Mich., assignors to Interkal, Inc., Kalamazoo, Mich.
Filed Oct. 16, 1997, Ser. No. 78,066
Term of patent 14 years
LOC (6) Cl. 25 - *02*
U.S. Cl. D25—38



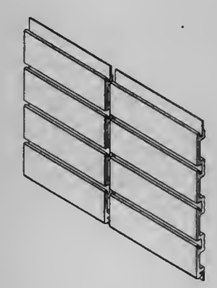
399,010
EXTRUDED SLATWALL SECTION
Wayne A. Current, Holmdel, N.J., assignor to International Visual Corporation, Port Washington, N.Y.
Filed May 16, 1997, Ser. No. 70,981
The portion of the term of this patent subsequent to Jun. 9, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—123



399,011
FLOORING SURFACE
Gerhard Berger, Weinheim, Germany, assignor to Carl Freudenberg, Weinheim, Germany
Filed Sep. 12, 1996, Ser. No. 59,522
Claims priority, application Germany, Mar. 14, 1996, M9602356.2
The portion of the term of this patent subsequent to Nov. 4, 2011, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—163



399,012
EXTRUDED SLATWALL SECTION
Wayne A. Current, Holmdel, N.J., assignor to International Visual Corporation, Port Washington, N.Y.
Filed May 16, 1997, Ser. No. 71,052
The portion of the term of this patent subsequent to Sep. 1, 2012, has been disclaimed.
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—123



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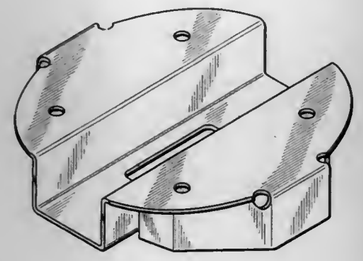
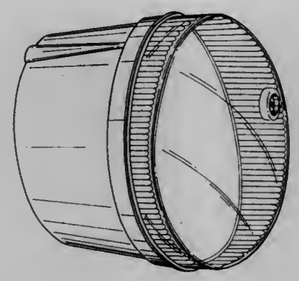
399,013
POST BASE FOR ROUND TIMBERS
Lan-Chi K. Nguyen, San Jose, Calif., assignor to Simpson Strong-Tie Company, Inc., Pleasanton, Calif.
Filed Oct. 30, 1997, Ser. No. 78,632
Term of patent 14 years
LOC (6) Cl. 25 - *01*
U.S. Cl. D25—133

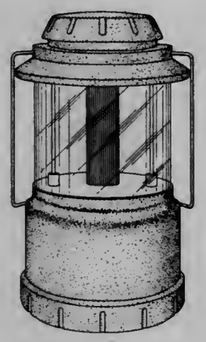


399,014
FLUTED NIGHT LIGHT
Ronald A. Emmerling, Montclair, N.J., assignor to American Tack & Hardware Co., Inc., Monsey, N.Y.
Filed Oct. 8, 1997, Ser. No. 77,742
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—26

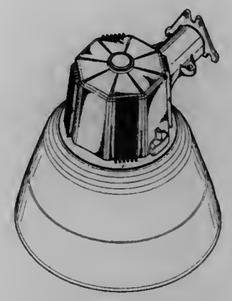
399,015
VEHICLE LAMP
Andrew J. Ponton, and Mark A. Singleton, both of Seymour, Ind., assignors to Osram Sylvania Inc., Danvers, Mass.
Filed Aug. 21, 1997, Ser. No. 75,742
Term of patent 14 years
LOC (6) Cl. 26 - *06*
U.S. Cl. D26—28



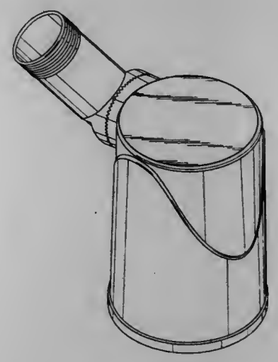
399,016
LANTERN
John Donaldson Howard, Brewster, N.Y., and Gary Evan van Deursen, Evergreen, Colo., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed Jun. 2, 1997, Ser. No. 71,565
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—42



399,017
MERCURY VAPOR LIGHT
Monte A. Leen, 1804 W. Lake Sammamish Pkwy. NE., Bellevue, Wash. 98008
Filed Oct. 3, 1997, Ser. No. 77,546
Term of patent 14 years
LOC (6) Cl. 26 - *02*
U.S. Cl. D26—45



399,018
ADJUSTABLE LAMP HOLDER
Bradford Brian Jensen, Berrien Spring; Kim Irwin McCavit, St. Joseph, and Dennis Leslie Haney, Benton Harbor, all of Mich., assignors to Heath Company, Inc., Benton Harbor, Mich.
Filed Nov. 19, 1997, Ser. No. 79,542
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—63



399,019
FLUORESCENT LIGHTING FIXTURE
Jean-Michel Wilmotte, Paris, France, assignor to Zumtobel Licht GmbH, Dornbirn, Austria
Filed Oct. 18, 1996, Ser. No. 61,232
Claims priority, application Germany, Apr. 19, 1996, M 96 03 679.6
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—77

399,020
PENDANT LAMP
Wen-Wang Lo, No. 6, Tinghu 2nd St., Kweishan Hsiang, Taoyuan Hsien, Taiwan
Filed Dec. 20, 1996, Ser. No. 64,055
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—90

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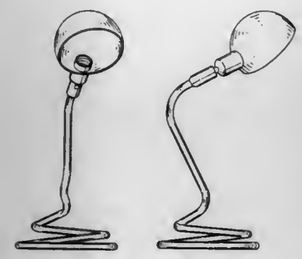
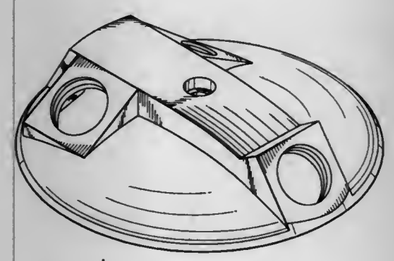
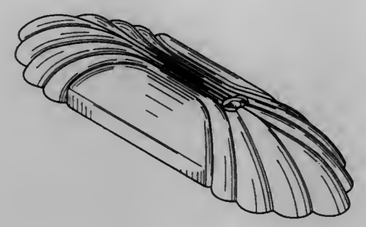
399,021
TABLE LAMP
Tin Po Jose Lam, RM 902-3 Tower II, China Hong Kong City,33 Canton Road, Tsim Sha Tsui,Kowloon, Hong Kong
Filed Jul. 2, 1997, Ser. No. 73,166
Term of patent 14 years
LOC (6) Cl. 26 - *05*
U.S. Cl. D26—106



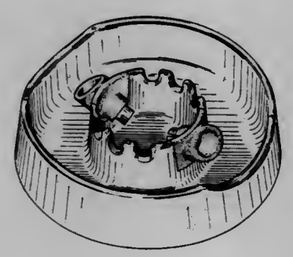
399,022
BACKPLATE FOR A DUAL FLOODLAMP FIXTURE
Bradford Brian Jensen, Berrien Spring; Kim Irwin McCavit, St. Joseph, and Dennis Leslie Haney, Benton Harbor, all of Mich., assignors to Heath Company, Inc., Benton Harbor, Mich.
Filed Nov. 19, 1997, Ser. No. 79,839
Term of patent 14 years
LOC (6) Cl. 26 - *99*
U.S. Cl. D26—142



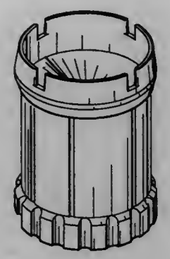
399,023
DECORATIVE PANEL FOR A CHANDELIER
David Lee, 3F, No. 23, Lane 82, Hu Lin St., Hsin Yih Dist., Taipei, Taiwan
Filed Jul. 29, 1997, Ser. No. 74,116
Term of patent 14 years
LOC (6) Cl. 26 - *99*
U.S. Cl. D26—152



399,024
ASHTRAY
Enrique Hicaro, Jr., and David A. Sherman, both of Chicago, Ill., assignors to Perfect World Technologies, L.L.C., Chicago, Ill.
Filed Apr. 9, 1997, Ser. No. 68,456
Term of patent 14 years
LOC (6) Cl. 27 - *03*
U.S. Cl. D27—102

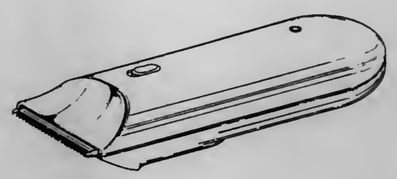


399,025
CIGARETTE EXTINGUISHER
J. E. Kenneth Whitlock, 6210 NW. 31st Ter., Bethany, Okla. 73008
Filed Jul. 28, 1997, Ser. No. 74,151
Term of patent 14 years
LOC (6) Cl. 27 - *03*
U.S. Cl. D27—134

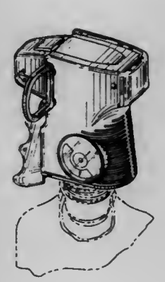


399,026
HAIR DRYER
Albart Johannes Kip, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 30, 1997, Ser. No. 74,198
Claims priority, application WIPO, Feb. 12, 1997, DMA /003591
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—13

399,027
TRIMMER
Woody Yaow, Taipei Hsien, Taiwan, assignor to Soaring Benefit Ltd., San Chung, Taiwan
Filed Aug. 6, 1997, Ser. No. 74,580
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—53



399,028
FRONT SQUEEZE TRIGGER FOR A FIRE EXTINGUISHER
Kenneth R. Fenne, Glen Ellyn, Ill.; Clay Burns, Boston, Mass.; Victor Cheung, Chicago, Ill.; Paul Sabin, Milton, Mass., and Susannah Gardner, Berkeley, Calif., assignors to BRK Brands, Inc., Aurora, Ill.
Filed Feb. 5, 1996, Ser. No. 49,933
Term of patent 14 years
LOC (6) Cl. 29 - *01*
U.S. Cl. D29—129



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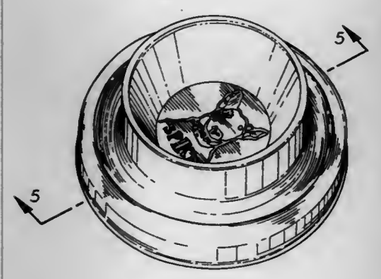
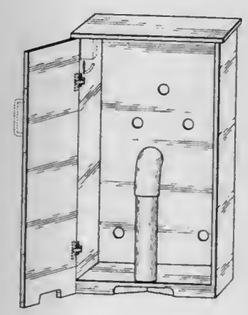
399,029
PET FOOD DISH
Angelo C. Falcone, and Donna Falcone, both of 6209 Pacific Ave. #201, Playa del Rey, Calif. 90293
Filed Apr. 15, 1997, Ser. No. 69,222
Term of patent 14 years
LOC (6) Cl. 30 - *03*
U.S. Cl. D30—130

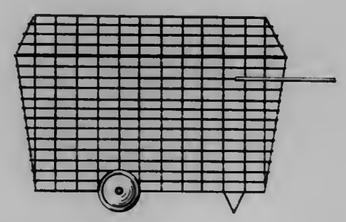


399,030
VACUUM CLEANER ENCLOSURE
Gene M. Lopes, 1335 Dixieanne, Unit B, Sacramento, Calif. 95815
Filed May 6, 1997, Ser. No. 70,329
Term of patent 14 years
LOC (6) Cl. 15 - *05*
U.S. Cl. D32—21

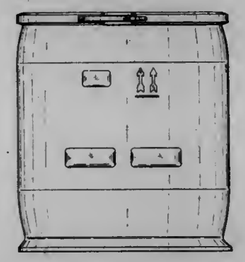


399,031
FRAME FOR A SPRAYER ASSEMBLY
Jacob R. Prosper, Brockville; Tri Nguyen, Toronto; Colin Dyke, North Augusta; Jerry N. Moscovitch, Toronto; Rene Allen, Oakville, all of Canada, and Gabriel E. Concari, Eldersburg, Md., assignors to Black & Decker Inc., Newark, Del.
Filed Apr. 24, 1997, Ser. No. 68,991
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—24

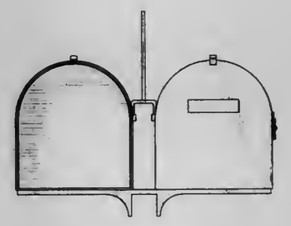
399,032
TRASH CONTAINER CART
Clayton Limbaugh, 2333 Winchester Hwy., Kelso, Tenn. 37348
Filed Jul. 11, 1997, Ser. No. 73,622
Term of patent 14 years
LOC (6) Cl. 12 - *02*
U.S. Cl. D34—25



399,033
LIDDED DRUM
Dietmar Przytulla, Kerpen, Germany, assignor to Mauser-Werke GmbH, Brühl, Germany
Filed Mar. 29, 1996, Ser. No. 52,422
Claims priority, application Germany, Sep. 29, 1995, M 95 07 705.7
Term of patent 14 years
LOC (6) Cl. 09 - *02*
U.S. Cl. D34—39



399,034
DOUBLE DOOR MAILBOX WITH ONE-DOOR NEWSPAPER BOX
James A. Duane, 752 Leeward Ave., Beachwood, N.J. 08722
Continuation-in-part of Ser. No. 51,825, Mar. 19, 1996, Pat. No. Des. 385,683. This application Nov. 18, 1996, Ser. No. 62,506
Term of patent 14 years
LOC (6) Cl. 99 - *00*
U.S. Cl. D99—31



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29th DAY OF SEPTEMBER, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Menarini Industrie Farmaceutiche Riunite S.R.L.: *See—*
Animati, Fabio; Arcamone, Federico; Giannini, Giuseppe; Lombardi, Paolo; and Monteagudo, Edith, 5,814,608, Cl. 514-34.000.

A Rifkin CO.: *See—*
Rifkin, Michael S., 5,814,797, Cl. 235-379.000.

Aaker, Kenneth Dale; Delp, Gary Scott; Sendelbach, Lee Anton; and Slane, Albert Alfonse, to International Business Machines Corporation. Method and apparatus for producing transmission control protocol checksums using internet protocol fragmentation. 5,815,516, Cl. 371-53.000.

Abatement Technologies, Inc.: *See—*
Nolan, James R.; and Kruse, Gary E., 5,813,089, Cl. 15-383.000.

ABB Research Ltd.: *See—*
Eroglu, Adnan; Knöpfel, Hans Peter; and Senior, Peter, 5,813,847, Cl. 431-8.000.
Hermansson, Willy, 5,814,546, Cl. 438-309.000.

ABB Vetco Gray Inc.: *See—*
Borak, Eugene A., Jr., 5,813,468, Cl. 166-368.000.
Radi, Amin, 5,813,470, Cl. 166-382.000.

Abbott Laboratories: *See—*
Carrino, John J.; and Brainard, Thomas D., 5,814,492, Cl. 435-91.200.

Abe, Tetsuya; and Ogawa, Kimiaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Strobe apparatus of a still video camera with adjustable color temperature. 5,815,204, Cl. 348-371.000.

Abe, Tetsuya; Ito, Takayuki; and Enomoto, Takashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Fast aspherical zoom lens system. 5,815,323, Cl. 359-688.000.

Abe, Yoshinori, to Pioneer Electronic Corporation. Multivalue digital transmission system. 5,815,536, Cl. 375-344.000.

Abe, Yuki: *See—*
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Kaneko, Yawara; and Yamada, Norihide, to Hewlett-Packard Company. Gas-phase etching and regrowth method for Group III-nitride crystals. 5,814,239, Cl. 216-63.000.

Kanellakopulos, Johannes; Fuchs, Rainer; Jansen, Johannes Rudolf; Schindler, Michael; Erdelen, Christoph; Leicht, Wolfgang; Wachendorff-Neumann, Ulrike; and Turberg, Andreas, to Bayer Aktiengesellschaft. Arylor hetaryl substituted nitrogen heterocycles and their use as pesticides. 5,814,645, Cl. 514-332.000.

Kanemitsu, Yoichi; and Watanabe, Katsuhide, to Ebara Corporation. Electron microscope. 5,814,814, Cl. 250-310.000.

Kannan, Ravi; Katchapalayam, Babu; and Liu, Bing. Method and software products for continued application execution after generation of fatal exceptions. 5,815,702, Cl. 395-591.000.

Kannankeril, Charles P.; Cruikshank, Bruce A.; Gavronsky, German; and Farison, Brian K., to Sealed Air Corporation. Dispenser for plastic bags. 5,813,585, Cl. 225-106.000.

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Kao Corporation: *See—*
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Kao, Jui-Chien. Tool box assembly. 5,813,531, Cl. 206-373.000.

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Zanin, Yvano; and Farrugia, Jean-Paul, to Reneka International Zone Industrielle. Individual unit for preparing and serving coffee for "espresso" type coffeemaker. 5,813,318, Cl. 99-291.000.

Zanini-Fisher, Margherita: *See—*
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Zank, Gregg Alan: *See—*
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Zanzig, Jerald G.; Stragier, Marcel G.; and Pickrell, John W., to Heil Company, The. Method of collecting refuse. 5,813,824, Cl. 414-786.000.

Zare, Richard N.; Martin, Juergen; and Paldus, Barbara A., to Leland Stanford Junior Univesity, The Board of Trustees of the. Deflecting light into resonant cavities for spectroscopy. 5,815,277, Cl. 356-440.000.

Zargar, Dara. Job cost accounting data compression and indexing system and methods for doing the same. 5,815,829, Cl. 705-30.000.

Zaterka, David: *See—*
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Zelenák, Zoltai Mária née; Berzsenyi, László; and Abramoff, Frank, to Life International Products, Inc. Oxygen enriched liquids, method and apparatus for making, and applications thereof. 5,814,222, Cl. 210-615.000.

Zeller, Robert S.; and Vroman, Christopher J., to Millipore Corporation. Method for forming dendritic metal particles. 5,814,272, Cl. 264-653.000.

Zeneca Limited: *See—*
Barker, Andrew John; and Johnstone, Craig, 5,814,630, Cl. 514-234.500.

Zepkowski, John. Screw driving tool. 5,813,297, Cl. 81-426.500.

Zhang, Hongyong, to Semiconductor Energy Laboratory Co., Ltd. Method for producing a semiconductor integrated circuit including a thin film transistor and a capacitor. 5,814,529, Cl. 438-30.000.

Zhang, Ke. Methods for the treatment of gastrointestinal tract disorders. 5,814,308, Cl. 424-85.100.

Zhang, Kevin X.: *See—*
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Zhao, Min; Fan, Jin; Liu, Jun; Hu, Xiaoling; and Fan, Minqi, to Jiangsu Institute of Microbiology. Semisynthetic 1-N-ethylgentamicin C_{1a} and method for its preparation. 5,814,488, Cl. 435-84.000.
Zhen, Ken: *See*—
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Zhou, Changming; Shou, Guoliang; Yamamoto, Makoto; Sawahashi, Mamoru; Adachi, Fumiyuki; and Takatori, Sunao, to NTT Mobile Communications Network, Inc.; and Yozan, Inc. Soft handoff system of spread spectrum communication. 5,815,812, Cl. 455-442.000.
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Zhou, Lin; and Zhang, Xue-shan. Method and apparatus for regulating and improving the status of development and survival of living organisms. 5,814,078, Cl. 607-1.000.
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Ziegler, Daniel L.; and Fallandy, Michael M., to Harris Corporation. Impact/no-impact punchdown tool for use with cut/no-cut or wire insertion blade assembly. 5,813,109, Cl. 29-566.400.
Ziegler, Robert "Zig", to Allergan, Inc. Safety-vac capsule polisher. 5,814,010, Cl. 604-22.000.
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Zimmer, Volker; Macho, Heinz; and Lerch, Rolf, to Boeringer Mannheim GmbH. Multilayer analytical element for the determination of an analyte in a liquid. 5,814,522, Cl. 436-170.000.
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Zip Dee, Inc.: *See*—
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Ziv, David: *See*—
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Znaiden, Alexander Paul; Crotty, Brian Andrew; and Johnson, Anthony, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Skin treatment with alpha-hydroxycarboxylic acids of mixed chain length. 5,814,662, Cl. 514-557.000.
Zoè , Willow: *See*—
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Whittemore, Marilyn S.; Glover, Daniel E.; Zollinger, Mark L.; and Bryant, Stephen D., 5,814,668, Cl. 514-625.000.
Zoppitelli, Elio; and Girard, Laurent Jean Daniel, to Eurocopter France. Suspension device for a transmission box of a rotary-wing aircraft. 5,813,626, Cl. 244-17.270.
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Zornes, David A.; and Bauer, John J. Balanced adsorbent refrigerator. 5,813,248, Cl. 62-480.000.
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Zutler, Michael; Kipnes, Robert; Klein, John; Zutler, Bruce; and Zutler, Aaron, to MCI Products Group, Inc. Golf stand. 5,813,414, Cl. 131-241.000.
Zybert, Mark. Cylinder holder for cylindrical tank. 5,813,643, Cl. 248-310.000.
3-Strikes Custom Design: *See*—
Kaufman, Mark S., 5,813,538, Cl. 206-457.000.
3D Systems, Inc.: *See*—
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3DLabs Inc., Ltd.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

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NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fondelius, Johan. Seal housing with helical element. RE. 35,909, Cl. 277-352.000.
Gomez de Rosas, Ricardo R.; and Suarez, Esteban O. Method of installing lean-to well protector. RE. 35,912, Cl. 405-227.000.
Hitachi, Ltd.: *See*—
Kitaguchi, Hiroshi; Izumi, Shigeru; and Kaihara, Akihasa, RE. 35,908, Cl. 250-370.050.
Izumi, Shigeru: *See*—
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Kaihara, Akihasa: *See*—
Kitaguchi, Hiroshi; Izumi, Shigeru; and Kaihara, Akihasa, RE. 35,908, Cl. 250-370.050.
Kitaguchi, Hiroshi; Izumi, Shigeru; and Kaihara, Akihasa, to Hitachi, Ltd. Neutron individual dose meter neutron dose rate meter, neutron detector and its method of manufacture. RE. 35,908, Cl. 250-370.050.
Matsushita Electric Industrial Co., Ltd.: *See*—
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, RE. 35,910, Cl. 348-416.000.
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, to Matsushita Electric Industrial Co., Ltd. Moving image signal encoding apparatus and decoding apparatus. RE. 35,910, Cl. 348-416.000.
Nike, Inc.: *See*—
Vincent, Stephen M.; and Vattes, David L., RE. 35,905, Cl. 12-142.00P.
Obrecht, Robert E., to REO Hydraulic Pierce & Form, Inc. Adjustable base assembly. RE. 35,907, Cl. 248-657.000.
Ohio Electronic Engravers, Inc.: *See*—
Seitz, David R.; and Stuve, Juli Ann, RE. 35,911, Cl. 358-299.000.
REO Hydraulic Pierce & Form, Inc: *See*—
Obrecht, Robert E., RE. 35,907, Cl. 248-657.000.
Sanders, Bruce C., to Swenson, Michael D. Remote control floatation boom. RE. 35,906, Cl. 43-6.500.
Seitz, David R.; and Stuve, Juli Ann, to Ohio Electronic Engravers, Inc. Method for predicting ink comsumption. RE. 35,911, Cl. 358-299.000.
Stuve, Juli Ann: *See*—
Seitz, David R.; and Stuve, Juli Ann, RE. 35,911, Cl. 358-299.000.
Suarez, Esteban O.: *See*—
Gomez de Rosas, Ricardo R.; and Suarez, Esteban O., RE. 35,912, Cl. 405-227.000.
Swenson, Michael D.: *See*—
Sanders, Bruce C., RE. 35,906, Cl. 43-6.500.
Takahashi, Kenichi: *See*—
Nagata, Atsushi; Takahashi, Kenichi; and Takeguchi, Nobuyasu, RE. 35,910, Cl. 348-416.000.
Takeguchi, Nobuyasu: *See*—
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Vattes, David L.: *See*—
Vincent, Stephen M.; and Vattes, David L., RE. 35,905, Cl. 12-142.00P.
Vincent, Stephen M.; and Vattes, David L., to Nike, Inc. Method of manufacturing a midsole for a shoe and construction therefor. RE. 35,905, Cl. 12-142.00P.

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CERTIFICATES WERE ISSUED

Bell Data Software Corp.: *See*—
Belluci, Barry P.; and Charlip, Eliot, B1 505,494, Cl. 283-75.000.
Belluci, Barry P.; and Charlip, Eliot, to Bell Data Software Corp. System for producing a personal ID card. B1 505,494, Cl. 283-75.000.
Charlip, Eliot: *See*—
Belluci, Barry P.; and Charlip, Eliot, B1 505,494, Cl. 283-75.000.
Ciallella, John G.: *See*—
Gordon, Richard; and Ciallella, John G., B1 291,815, Cl. 220-200.000.
Dolman, Kevin F., to Warman International Ltd. Ferrochromium alloy and method thereof. B1 252,149, Cl. 148-605.000.
Gordon, Richard; and Ciallella, John G., to Semiconductor Packaging Materials Co., Inc. Ceramic lid assembly for hermetic sealing of a semiconductor chip. B1 291,815, Cl. 220-200.000.
Hart, John: *See*—
Paré, François; and Hart, John, B1 389,248, Cl. 210-151.000.
Maybon, Guy, to Technogenia S.A., Societe Anonyme. Composition of abrasion-resistant material for application to a surface. B1 699,848, Cl. 428-560.000.
Michaud, Horst: *See*—
Seyerl, Joachim v.; and Michaud, Horst, B1 223,172, Cl. 252-182.120.
Paré, François; and Hart, John, to Tour McGill College. Bioreactor for biological treatment of contaminated water. B1 389,248, Cl. 210-151.000.
Pascoe, Robert D., to Union Switch & Signal Inc. Virtual block control system for railway vehicle. B1 398,894, Cl. 246-28.00R.
Semiconductor Packaging Materials Co., Inc.: *See*—
Gordon, Richard; and Ciallella, John G., B1 291,815, Cl. 220-200.000.
Seyerl, Joachim v.; and Michaud, Horst, to SKW Trostberg Aktiengesellschaft. Hardener for epoxide resin masses. B1 223,172, Cl. 252-182.120.
SKW Trostberg Aktiengesellschaft: *See*—
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Ahrens, Kenneth A.: *See*—
Victor, Daniel R.; McKay, Stanley W.; Guiles, Melvin J.; and Ahrens, Kenneth A., 399,009, Cl. D25-38.000.
Aihara, Sanae, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner. 398,974, Cl. D23-351.000.
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American Saw & Mfg. Company: *See*—
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American Sport Line, Inc.: *See*—
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American Tack & Hardware Co., Inc.: *See*—
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Avar, Eric P., to Nike, Inc. Portion of a shoe sole. 398,742, Cl. D2-947.000.
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Bausch & Lomb Incorporated: *See*—
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Bayerische Motoren Werke Aktiengesellschaft: *See*—
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Benham, Brent Belden. Kit containing emergency medical information. 398,772, Cl. D3-203.000.
Bergenham, Lance R. Video book. 398,905, Cl. D14-100.000.
Berger, Gerhard, to Freudenberg, Carl. Flooring surface. 399,011, Cl. D25-163.000.
Bernardi, Mark, to Zenith Electronics Corporation. Portion of a display panel with a surfing icon image. 398,916, Cl. D14-114.700.
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Brown, Stephanie Carol; Ratliff, Billy Joe, Jr.; and Kolowski, Michael Alois, to Goodyear Tire & Rubber Company, The. Tire tread. 398,887, Cl. D12-146.000.
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Yaow, Woody, to Soaring Benefit Ltd. Trimmer. 399,027, Cl. D28-53.000.
Yen, Kerl. Video sender. 398,919, Cl. D14-125.000.
Yen, Kerl. Video sender. 398,920, Cl. D14-125.000.
Yosun Industrial Corp.: *See*—
Tseng, Tonny, 398,913, Cl. D14-114.000.
Young, Patrick Albert. Tank container. 398,951, Cl. D23-202.000.
Yu, Sun. Key chain light. 398,774, Cl. D3-209.000.
Yurkonis, Philip; Leverault, Craig; Pfeifer, Herbert H. F.; and Montgomery, Paul, to Sun Microsystems, Inc. Computer housing. 398,907, Cl. D14-102.000.
Yurkovic, Paula: *See*—
Katzman, Allison; Klimpert, Randall Jon; Lauble, Dianne Elizabeth; Lichodziejewski, Michael John; Sellers, Craig Dennis; and Yurkovic, Paula, 398,943, Cl. D21-109.000.
Zapf, Otto. Drawer panel. 398,795, Cl. D6-510.000.
Zeller Plastik, Inc.: *See*—
Gaiser, Rick; Hierzer, Valentin; and Simpson, Robert, 398,851, Cl. D9-447.000.
Zenith Electronics Corporation: *See*—
Bernardi, Mark, 398,916, Cl. D14-114.700.
Zumtobel Licht GmbH: *See*—
Wilmotte, Jean-Michel, 399,019, Cl. D26-77.000.

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LIST OF PLANT PATENTEES

Akerboom, Petrus J., to De Nachtvlinder B.V. Aster plant named 'Karmijn'. 10,624, Cl. Plt.-68.100.

Austin, David Charles Henshaw, to David Austin Roses Limited. Shrub rose plant named 'Ausky'. 10,617, Cl. Plt.-1.000.

Austin, David Charles Henshaw, to David Austin Roses Limited. Shrub rose plant named 'Auscook'. 10,618, Cl. Plt.-1.000.

Bear Creek Gardens, Inc.: *See*—
Walden, John K., 10,616, Cl. Plt.-1.000.

Cebeco Lilies, Inc.: *See*—
Egger, Donald L., 10,626. Cl. Plt.-87.400.

CP (Delaware), Inc.: *See*—
Meilland, Alain A., 10,622, Cl. Plt.-17.000.

David Austin Roses Limited: *See*—
Austin, David Charles Henshaw, 10,617, Cl. Plt.-1.000.
Austin, David Charles Henshaw, 10,618, Cl. Plt.-1.000.

De Nachtvlinder B.V.: *See*—
Akerboom, Petrus J., 10,624, Cl. Plt.-68.100.

De Ruiter's Nieuwe Rozen B.V.: *See*—
Pouw, A. A., 10,619, Cl. Plt.-11.000.

DeClercq, Danny, to Twyford International, Inc. Spathiphyllum plant 'Jungfrau'. 10,627, Cl. Plt.-88.100.

Delbard, Guy, to Societe Anonyme Des Pepinieres et Roseraies Georges Delbard. Hybrid Tea rose plant named 'Delblacrem'. 10,620, Cl. Plt.-11.000.

Delbard, Guy, to Societe Anonyme Des Pepinieres et Roseraies Georges Delbard. Hybrid Tea rose plant named 'Delstribuc'. 10,621, Cl. Plt.-13.000.

Egger, Donald L., to Cebeco Lilies, Inc. Longiflorum ×Asiatic hybrid lily plant named 'Ceb Charm'. 10,626, Cl. Plt.-87.400.

Holtkamp, Reinhold, Sr., to International Plant Breeding A.G. African violet plant named 'Improved Hawaii'. 10,625, Cl. Plt.-69.200.

International Plant Breeding A.G.: *See*—
Holtkamp, Reinhold, Sr., 10,625, Cl. Plt.-69.200.

Jomobel NV: *See*—
Wouters, Kris, 10,623, Cl. Plt.-34.100.

Meilland, Alain A., to CP (Delaware), Inc. Hybrid Tea rose plant named 'Meicobuis'. 10,622, Cl. Plt.-17.000.

Pouw, A. A., to De Ruiter's Nieuwe Rozen B.V. Hybrid Tea rose plant named 'Ruikwien'. 10,619, Cl. Plt.-11.000.

Societe Anonyme Des Pepinieres et Roseraies Georges Delbard: *See*—
Delbard, Guy, 10,620, Cl. Plt.-11.000.
Delbard, Guy, 10,621, Cl. Plt.-13.000.

Twyford International, Inc.: *See*—
DeClercq, Danny, 10,627, Cl. Plt.-88.100.

Walden, John K., to Bear Creek Gardens, Inc. Shrub rose plant named 'JACchari'. 10,616, Cl. Plt.-1.000.

Wouters, Kris, to Jomobel NV. Variety of apple tree Bel-El. 10,623, Cl. Plt.-34.100.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 29, 1998

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2
6.5 5,813,048
8 5,813,049
16 5,813,050
69 5,813,051
114 5,813,052
145 5,813,053
425 5,813,055
452 5,813,056

CLASS 4
233 5,813,057
309 5,813,058
325 5,813,059
351 5,813,060
431 5,813,061
556 5,813,062
626 5,813,063
665 5,813,047

CLASS 5
99.1 5,813,064
639 5,813,065
655 5,813,066
713 5,813,067

CLASS 8
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151.2 5,813,068
159 5,813,069
409 5,814,106
442 5,814,107

CLASS 12
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71.1 5,813,071
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CLASS 15
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21.1 5,813,074
22.1 5,813,075
97.3 5,813,076
5,813,077
160 5,813,078
167.1 5,813,079
209.1 5,813,080
210.1 5,813,081
230.13 5,813,082
236.01 5,813,083
236.05 5,813,084
314 5,813,085
320 5,813,086
321 5,813,087
327.5 5,813,088
383 5,813,089

CLASS 16
37 5,813,090
82 5,813,091
110 R 5,813,092
329 5,813,093

CLASS 24
381 5,813,094
442 5,813,095
573.1 5,813,096
631 5,813,097

CLASS 27
1 5,813,098
2 5,813,099
6 5,813,100

CLASS 28
114 5,813,101
118 5,813,102

CLASS 29
33 K 5,813,103
235 5,813,104
411 5,813,105
429 5,813,106
557 5,813,107
564.6 5,813,108
566.4 5,813,109
623.1 5,814,108
701 5,813,110
748 5,813,111
760 5,813,113
809 5,813,114
832 5,813,115
874 5,813,117
889.1 5,813,118

CLASS 30
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123 5,813,120
162 5,813,121
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382 5,813,123

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1 N 5,813,124
451 5,813,125
474 5,813,126
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502 5,813,128
509 5,813,129
528 5,813,130
645 5,813,131
759 5,813,132

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447 5,813,152

CLASS 40
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CLASS 43
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107 5,813,166

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CLASS 48
197 R 5,814,112

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139 5,813,171

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298 5,814,113

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79.1 5,813,174
167.1 5,813,175
198 5,813,176
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255 5,813,179
270 5,813,180
291 5,813,181
295 5,813,182
311.1 5,813,183
518 5,813,184
562 5,813,185
604 5,813,186
664 5,813,187
699 5,813,188
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448 5,813,196
453 5,813,197
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567 5,813,200

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385.4 5,814,118

CLASS 56
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364 5,813,205
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CLASS 57
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264 5,813,210
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39.5 5,813,212
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204 5,813,218
223 5,813,219
226.2 5,813,220
261 5,813,221
274 5,813,222
5,813,223
5,813,224
327 5,813,225
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367 5,813,227
454 5,813,228
525 5,813,229
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52.1 5,813,237
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85 5,813,240
148 5,813,241
156 5,813,242
259.2 5,813,243
324.6 5,813,244
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391 5,813,246
434 5,813,247
480 5,813,248
509 5,813,249
612 5,813,250
646 5,813,251
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393 5,814,122

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261 5,813,269
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335.04 5,814,726
514.17 5,814,727
587 5,814,728
588 5,814,729
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644 5,814,731
657 5,814,732
658 5,814,733
819 5,814,734
861.22 5,814,735
861.25 5,814,736
861.28 5,814,737
861.357 5,814,739
861.55 5,814,738
862.641 5,814,740
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863.83 5,814,743

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473.3 5,813,285
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490.06 5,813,287
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493 5,813,289
501.5 R 5,813,290
665 C 5,813,292

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CLASS 76
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CLASS 81
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CLASS 82
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365 5,813,304
508 5,813,305
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600 5,814,749
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604 5,814,751
711 5,814,752

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6.5 5,814,755
5,814,756
14.3 5,814,757

CLASS 91
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447 5,813,309
513 5,813,311
516 5,813,312

CLASS 92
5 R 5,813,313
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90 5,814,129
96 5,814,130
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123 5,814,132
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CLASS 96
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58 5,814,135
147 5,814,136

CLASS 99
285 5,813,317
291 5,813,318
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333 5,813,320
340 5,813,321

CLASS 100
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129 5,813,331
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218 5,813,336
228 5,813,337
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335 5,813,339
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407.1 5,813,343
416.1 5,813,341
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463.1 5,813,345
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31.43 5,814,138
31.78 5,814,139
31.89 5,814,140
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499 5,814,144
737 5,814,145
802 5,814,146
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361 5,813,360
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CLASS 118
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723 R 5,814,154

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501 5,813,364
528 5,813,365
710 5,813,366
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799 5,813,368
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201 5,813,418
222 5,813,419
294 5,813,420
318 5,813,421

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6 5,814,159
8 5,814,160
21 5,814,161
22.12 5,814,162
39 5,814,163
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145 5,813,425

CLASS 137
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266 5,813,429
318 5,813,430
360 5,813,431
413 5,813,432
553 5,813,433
587 5,813,434
625.41 5,813,435
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121 5,813,438
134 5,813,439

CLASS 139
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455 5,813,441

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CLASS 148
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605 B1 252,149
606 5,814,166
639 5,814,167
682 5,814,168

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106 5,813,445

CLASS 152
209 R 5,814,169

CLASS 156
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71 5,814,172
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167 5,814,176
290 5,814,178
294 5,814,179
333 5,814,180
351 5,814,181
358 5,814,182
442.2 5,814,183
577 5,814,184
580 5,814,185
643.1 5,814,186

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370.22 5,813,449
370.23 5,813,450

CLASS 162
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134.1 5,813,453
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CLASS 166
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250.17 5,813,460
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298 5,813,465
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367 5,813,467
368 5,813,468
369 5,813,469
382 5,813,470

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662 5,813,473
701.3 5,813,474
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40 CC 5,814,763
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50.54 5,814,765
65 R 5,814,766
68.1 5,814,767
110 FC 5,814,768
117 F 5,814,769
135 5,814,770

CLASS 175
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52 5,813,481
61 5,813,482
218 5,813,483
325.2 5,813,484
430 5,813,485

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171 5,814,773

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65.1 5,813,487
65.6 5,813,488
68.1 5,813,489
250 5,813,490
309 5,813,491
417 5,813,492

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3 5,813,486
97 5,813,494
155 5,813,495

CLASS 184
6.12 5,813,493
6.4 5,813,496

CLASS 186
49 5,813,497

CLASS 187
292 5,814,774
324 5,813,498

CLASS 188
59 5,813,499
282.8 5,813,500
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18 A 5,813,503
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CLASS 192
3.28 5,813,505
3.29 5,813,506
89.23 5,813,507
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CLASS 194
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206 5,813,510
217 5,813,511

CLASS 198
346.2 5,813,514
370.05 5,813,515
459.5 5,813,512
604 5,813,516
759 5,813,517
803.14 5,813,513
817 5,813,518

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50.33 5,814,777
61.45 R 5,814,778
83 P 5,814,779
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343 5,813,520
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550 5,813,522

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298.15 5,814,196
453 5,814,199
524 5,814,197
547 5,814,200
612 5,814,201

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315.1 5,813,529
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315.3 5,813,527
373 5,813,530
5,813,531
379 5,813,532
5,813,533
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419 5,813,535
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453 5,813,537
457 5,813,538
459.1 5,813,539
497 5,813,540

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113 5,814,208
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388 5,814,218
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516 5,814,220
542 5,814,221
615 5,814,222
635 5,814,223
638 5,814,224
656 5,814,225
661 5,814,226
696 5,814,227
703 5,814,228
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710 5,814,230
737 5,814,231
739 5,814,232
759 5,814,233
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34 5,813,547
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87.01 5,813,549
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CLASS 212
278 5,813,551
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CLASS 215
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274 5,813,554

CLASS 216
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24 5,814,237
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63 5,814,239
88 5,814,240

CLASS 217
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CLASS 218
60 5,814,781
143 5,814,782

CLASS 219
110 5,814,783
121.6 5,814,784
121.63 5,814,786
121.64 5,814,787
133 5,814,788
388 5,814,789
421 5,814,790
504 5,814,791
544 5,814,792
685 5,814,794
732 5,814,795
757 5,814,793

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23.9 5,813,557
200 B1 291,815
258 5,813,559
266 5,813,560
269 5,813,561
495.05 5,813,562
522 5,813,563
5,813,564
619 5,813,565
653 5,813,566
735 5,813,567

CLASS 221
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150 R 5,813,569

CLASS 222
82 5,813,570
95 5,813,571
107 5,813,572
135 5,813,573
146.6 5,813,574
182 5,813,575
190 5,813,576
212 5,813,577

CLASS 223
94 5,813,578

CLASS 224
42.11 5,813,579
160 5,813,580
251 5,813,581
407 5,813,582
483 5,813,583
605 5,813,584

CLASS 225
106 5,813,585

CLASS 226
8 5,813,586
29 5,813,587

CLASS 227
67 5,813,589
109 5,813,588

CLASS 228
4.5 5,813,590
41 5,813,591
112.1 5,813,592
5,813,593
146 5,813,594
200 5,813,595

CLASS 229
92.8 5,813,596
122.1 5,813,597

CLASS 232
181.1 5,814,241

CLASS 235
375 5,814,796
379 5,814,797
380 5,814,798
383 5,814,799
448 5,814,800
454 5,814,801
455 5,814,802
462 5,814,803
472 5,814,804
479 5,814,805
494 5,814,806

CLASS 236
34.5 5,813,598
49.3 5,813,599
5,813,600
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CLASS 238
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CLASS 239
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33 5,813,604
64 5,813,605
67 5,813,606
110 5,813,608
127.3 5,813,609
135 5,813,610
265.37 5,813,611
676 5,813,613
690 5,813,614

CLASS 241
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135 5,813,617
259.1 5,813,618

CLASS 242
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232 5,813,620
336 5,813,621
348 5,813,622
527.4 5,813,623
560 5,813,624

CLASS 244
17.11 5,813,625
17.27 5,813,626
33 5,813,627
36 5,813,628
118.5 5,813,630
118.6 5,813,629
134 A 5,813,631
159 5,813,632
169 5,813,633
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CLASS 248
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188.5 5,813,639
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223.41 5,813,641
229.15 5,813,642
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311.2 5,813,644
5,813,645
5,813,646
354.7 5,813,647
424 5,813,648
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638 5,813,650
657 RE. 35,907

CLASS 250
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206.1 5,814,808
208.1 5,814,809
5,814,810
231.16 5,814,812
287 5,814,813
310 5,814,814
311 5,814,815
341.1 5,814,816
363.04 5,814,817
370.05 RE. 35,908
432 R 5,814,818
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492.21 5,814,819
5,814,822
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492.3 5,814,821
515.1 5,814,824
5,814,825
548 5,814,826
556 5,814,827
559.41 5,814,828
559.46 5,814,829
577 5,814,830
586 5,814,831

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129.1 5,813,653
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301.45 5,814,245
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CLASS 254
131 5,814,842
134.4 5,813,658
334 5,813,659
418 5,813,661

CLASS 256
25 5,813,662
59 5,813,663

CLASS 257
10 5,814,832
40 5,814,833
59 5,814,834
64 5,814,835
72 5,814,836
91 5,814,837
94 5,814,838
96 5,814,839
103 5,814,840
113 5,814,841
197 5,814,843
206 5,814,844
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5,814,846
209 5,814,847
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295 5,814,849
296 5,814,850
5,814,851
303 5,813,664
310 5,814,852
315 5,814,853
5,814,854
5,814,855
319 5,814,856
321 5,814,857
328 5,814,858
335 5,814,859
5,814,860
336 5,814,861
344 5,814,862
346 5,814,863
355 5,814,864
360 5,814,865
369 5,814,866
379 5,814,867
393 5,814,868
408 5,814,869
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448 5,814,872
449 5,814,873

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488 5,814,875
529 5,814,876
666 5,814,877
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678 5,814,880
686 5,814,881
704 5,814,882
712 5,814,883
723 5,814,884
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734 5,814,886
751 5,814,887
758 5,814,888
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40.5 5,814,252
42 5,814,253
46.4 5,814,254
70 5,814,255
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173.12 5,814,258
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553 5,814,270
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653 5,814,272

CLASS 266
168 5,814,273

CLASS 267
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CLASS 269
225 5,813,666

CLASS 270
58.14 5,813,667

CLASS 271
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CLASS 273
251 5,813,671
272 5,813,672
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CLASS 276
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CLASS 277
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CLASS 280
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47.26 5,813,680
87.051 5,813,681
149.2 5,813,682
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276 5,813,684
279 5,813,685
414.1 5,813,687
607 5,813,688
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689 5,813,691
728.2 5,813,692
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743.2 5,813,696
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CLASS 283
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CLASS 285
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148.23 5,813,702
179 5,813,703
226 5,813,704
321 5,813,705
363 5,813,706

CLASS 290
38 R 5,814,896

CLASS 292
165 5,813,708
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336.3 5,813,710
341.17 5,813,711

CLASS 294
65 5,813,713
65.5 5,813,712

CLASS 296
63 5,813,715
97.5 5,813,717
146.6 5,813,718
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CLASS 297
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16.1 5,813,721
239 5,813,722
367 5,813,724
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411.42 5,813,727

CLASS 300
21 5,813,728
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CLASS 303
15 5,813,730
89 5,813,731
146 5,813,732

CLASS 305
172 5,813,733

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10.1 5,814,897
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66 5,814,898
104 5,814,900
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116 5,814,902
125 5,814,903
130 5,814,904
147 5,814,905
150 5,814,906

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71 5,814,912
112 5,814,913
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242 5,814,915
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313 R 5,814,918
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339 5,814,921
359 5,814,922
600 5,814,962
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204 5,813,735
223.2 5,813,740
249.9 5,813,736
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318.03 5,814,927
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5,814,930
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504 5,814,935
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111.41 5,814,942
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169.3 5,814,947
241 P 5,814,948
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317 5,814,950
326 5,814,951
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380 5,814,956
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118 5,814,970
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224 5,814,976
267 5,814,977
282 5,814,978
284 5,814,979
311 5,814,980
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71.1 5,814,982
117 R 5,814,983
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207.26 5,814,986
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5,814,989
303 5,814,988
307 5,814,990
309 5,814,991
318 5,814,992
319 5,814,993
380 5,814,994
431 5,814,995
510 5,814,996
522 5,814,997
536 5,814,998
662 5,814,999
755 5,815,000
763 5,815,001
765 5,815,002

CLASS 326
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95 5,815,005
98 5,815,006
121 5,815,007
134 5,815,008

CLASS 327
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122 5,815,014
141 5,815,015
158 5,815,016
5,815,017
172 5,815,018
202 5,815,019
255 5,815,020
361 5,815,021
407 5,815,023
408 5,815,024
514 5,815,025
534 5,815,032
536 5,815,026
543 5,815,027
5,815,028
546 5,815,029
551 5,815,030
5,815,031
555 5,815,033
563 5,815,034

CLASS 329
311 5,815,035

CLASS 330
52 5,815,036
69 5,815,037
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252 5,815,039
264 5,815,040

CLASS 331
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57 5,815,042
5,815,043
117 R 5,815,044
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CLASS 332
103 5,815,046

CLASS 333
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101 5,815,048
106 5,815,049
161 5,815,050
172 5,815,051
175 5,815,052
191 5,815,053
5,815,054
193 5,815,055
202 5,815,056

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CLASS 336
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175 5,815,060
192 5,815,061
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22 R 5,815,063
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309 5,815,065

CLASS 340
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332 5,815,068
427 5,815,069
439 5,815,070
5,815,071
461 5,815,072
471 5,815,073
505 5,815,074
506 5,815,075
572 5,815,076
573 5,815,077
5,815,078
620 5,815,079
635 5,815,080
825.07 5,815,082
825.31 5,815,083
825.44 5,815,081
825.5 5,815,085
825.52 5,815,036
825.54 5,815,087
825.72 5,815,088
870.03 5,815,089
870.16 5,815,090
870.34 5,815,091
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937 5,815,093

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94 5,815,099
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143 5,815,102
144 5,815,103
5,815,104
155 5,815,105
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CLASS 342
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25 5,815,111
70 5,815,112
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359 5,815,115
373 5,815,116
442 5,815,117
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872 5,815,125

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97 5,815,134
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98 5,815,136
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157 5,815,139
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173 5,815,141
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191 5,815,143
326 5,815,144
327 5,815,145
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334 5,815,147
335 5,815,148
5,815,149
339 5,815,150
342 5,815,151
354 5,815,153
356 5,815,154
357 5,815,155
419 5,815,156
427 5,815,158
430 5,815,157
431 5,815,159
439 5,815,160
440 5,815,161
443 5,815,162
5,815,163
501 5,815,164
506 5,815,165
5,815,166
512 5,815,167
516 5,815,168
517 5,815,169
521 5,815,170
825.31 5,815,084

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19 5,815,174
33 5,815,176
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59 5,815,179
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65 5,815,181
85 5,815,182
86 5,815,183
89 5,815,184
92 5,815,185
101 5,815,186
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229 5,815,200
232 5,815,201
358 5,815,203
371 5,815,204
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403 5,815,207
5,815,209
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478 5,815,211
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533 5,815,213
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569 5,815,215
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53 5,815,245
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72 5,815,253
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150 5,815,256
155 5,815,257
244 5,815,259
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301 5,815,260
310 5,815,261
318 5,815,262
323 5,815,263
336 5,815,264
338 5,815,265
345 5,815,266
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92 5,815,340
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118 5,815,360
150 5,815,361
153 5,815,362
154 5,815,363
160 5,815,364
195 5,815,365
234 5,815,366
303 5,815,367
321.5 5,815,368
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686 5,815,369
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475.09 5,815,397
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489 5,815,403
5,815,404
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490 5,815,406
492 5,815,407
528.21 5,815,409
557 5,815,410
559 5,815,411
574 5,815,413
578 5,815,414
5,815,415
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5,815,417
582 5,815,418
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736.04 5,815,420
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185.29 5,815,441
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189.05 5,815,437
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189.09 5,815,446
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226 5,815,454
229 5,815,455
230.03 5,815,456
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171.1 5,813,758
208 5,813,759
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314 5,813,761
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160 5,815,466

CLASS 368

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CLASS 369

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5,815,470
30 5,815,471
32 5,815,472
44.26 5,815,473
47 5,815,474
5,815,475
48 5,815,476
50 5,815,477
5,815,478
77.2 5,815,479
84 5,815,480
97 5,815,481
112 5,815,482
244 5,815,483
275.1 5,815,484
275.3 5,815,485
275.4 5,815,486
291 5,815,487

CLASS 370

206 5,815,488
217 5,815,489
223 5,815,490
233 5,815,491
234 5,815,492
242 5,815,493
249 5,815,495
287 5,815,496
342 5,815,497
395 5,815,498
5,815,499
401 5,815,500
402 5,815,501
468 5,815,502
471 5,815,503
503 5,815,504
522 5,815,505
524 5,815,506

CLASS 371

5.1 5,815,507
5,815,508
21.2 5,815,509
22.1 5,815,510
22.31 5,815,512
22.5 5,815,511
27.4 5,815,513
42 5,815,514
43.7 5,815,515
53 5,815,516

CLASS 372

2 5,815,517
6 5,815,518
25 5,815,494
5,815,519
45 5,815,520
5,815,521
46 5,815,522
66 5,815,523
96 5,815,524

CLASS 374

11 5,813,763
12 5,813,764
141 5,813,765
5,813,766
142 5,813,767

CLASS 375

200 5,815,525
206 5,815,526
5,815,527
220 5,815,528
247 5,815,530
285 5,815,529
298 5,815,531
301 5,815,532
316 5,815,533
326 5,815,534
344 5,815,535
5,815,536
350 5,815,537
356 5,815,538
371 5,815,539
376 5,815,540
5,815,541

CLASS 376

280 5,815,542
285 5,815,543
313 5,815,544
442 5,815,545

CLASS 378

19 5,815,546
65 5,815,547
173 5,815,548
175 5,815,549

CLASS 379

37 5,815,550
88 5,815,551
5,815,552
5,815,553
90.01 5,815,554
93.07 5,815,555
93.25 5,815,556
102.06 5,815,557
106.04 5,815,558
112 5,815,559
114 5,815,560
115 5,815,561
210 5,815,563
211 5,815,562
233 5,815,564
265 5,815,565
5,815,566
377 5,815,567
386 5,815,568
399 5,815,569
428 5,815,570

CLASS 380

4 5,815,571
10 5,815,572
21 5,815,573
25 5,815,574
52 5,815,577

CLASS 381

1 5,815,578
58 5,815,580
68.4 5,815,581
71.6 5,815,582
77 5,815,583
86 5,815,584
96 5,815,585
124 5,815,586
199 5,815,587
301 5,815,579
309 5,815,588
346 5,815,589

CLASS 382

103 5,815,590
130 5,815,591
135 5,815,592
151 5,815,594
154 5,815,593
173 5,815,595
5,815,596
211 5,815,597
5,815,598
232 5,815,599
5,815,600
5,815,601
236 5,815,602
237 5,815,606
250 5,815,604
269 5,815,605
275 5,815,607
312 5,815,608

CLASS 384

192 5,813,768
513 5,813,769
545 5,813,770

CLASS 385

2 5,815,609
5,815,610
12 5,815,611
22 5,815,613
5,815,614
50 5,815,615
52 5,815,616
53 5,815,617
60 5,815,618
78 5,815,619
80 5,815,620
5,815,621
93 5,815,623
115 5,815,624
120 5,815,625
124 5,815,626
125 5,815,627
131 5,815,628
134 5,815,629

CLASS 386

44 5,815,630
46 5,815,631
5,815,632
92 5,815,633
96 5,815,634
113 5,815,635
116 5,815,636

CLASS 392

400 5,815,637

CLASS 395

2.44 5,815,639
21 5,815,638
86 5,815,640
108 5,815,641
109 5,815,642
112 5,815,643
112.04 5,815,649
117 5,815,645
163 5,815,646
182.01 5,815,647
182.03 5,815,648
182.04 5,815,650
182.08 5,815,651
183.14 5,815,653
5,815,654
183.21 5,815,655
185.07 5,815,656
186 5,815,657
5,815,658
200.33 5,815,659
200.38 5,815,660
200.46 5,815,661
200.47 5,815,662
200.49 5,815,663
200.57 5,815,664
200.59 5,815,665
200.61 5,815,666
200.62 5,815,667
200.68 5,815,668
5,815,669
200.77 5,815,670
5,815,671
282 5,815,672
287 5,815,673
5,815,674
293 5,815,675
5,815,676
306 5,815,677
309 5,815,678
5,815,679
311 5,815,680
5,815,681
348 5,815,152
500 5,815,682
5,815,683
5,815,684
5,815,685
5,815,686
5,815,687
5,815,688
551 5,815,689
552 5,815,690
555 5,815,691
556 5,815,692
5,815,693
5,815,694
561 5,815,695
580 5,815,696
583 5,815,697
584 5,815,698
586 5,815,699
587 5,815,700
591 5,815,701
5,815,702
613 5,815,703
615 5,815,704
652 5,815,705
5,815,706
681 5,815,707
683 5,815,708
5,815,709
5,815,710
701 5,815,711
5,815,712
702 5,815,713
704 5,815,714
705 5,815,715
5,815,716
5,815,717
5,815,718
707 5,815,719
709 5,815,720
5,815,721
712 5,815,722
750.04 5,815,724
5,815,725
800.01 5,815,726
5,815,727
5,815,728
800.2 5,815,723
800.32 5,815,729
825 5,815,730
830 5,815,731
856 5,815,732
868 5,815,733
880 5,815,734
892 5,815,735
898 5,815,736
905 5,815,737

CLASS 396

6 5,815,738
5,815,739
5,815,740
51 5,815,741
55 5,815,742
61 5,815,743
72 5,815,744
76 5,815,745
81 5,815,746
91 5,815,747
104 5,815,748
158 5,815,749
201 5,815,750
207 5,815,751
319 5,815,752
5,815,753
403 5,815,754
410 5,815,755
440 5,815,756
529 5,815,757
535 5,815,758
541 5,815,759
543 5,815,760
567 5,815,761
611 5,815,762
618 5,815,763

CLASS 399

1 5,815,764
18 5,815,765
21 5,815,766
25 5,815,767
27 5,815,768
87 5,815,770
90 5,815,771
107 5,815,772
113 5,815,644
117 5,815,773
159 5,815,774
162 5,815,775
174 5,815,776
5,815,777
249 5,815,779
260 5,815,780
274 5,815,781
285 5,815,782
302 5,815,783
358 5,815,784
5,815,785
376 5,815,786
393 5,815,787
400 5,815,788

CLASS 400

74 5,813,771
120.01 5,813,772
207 5,813,773
250 5,813,774
279 5,813,776
491 5,813,777
496 5,813,778
615.2 5,813,779
629 5,813,780
636 5,813,781
5,813,782
636.2 5,813,783

CLASS 401

98 5,813,784
190 5,813,785
195 5,813,786
199 5,813,787

CLASS 403

57 5,813,788
135 5,813,789
283 5,813,790
294 5,813,791
322 5,813,792
325 5,813,793
359 5,813,794
402 5,813,795

CLASS 404

6 5,813,796

CLASS 405

52 5,813,797
5,813,798
128 5,813,799
227 RE. 35,912
232 5,813,800

CLASS 406

14 5,813,801

CLASS 408

68 5,813,802
115 R 5,813,803
145 5,813,804
241 R 5,813,805

CLASS 409

11 5,813,806
178 5,813,807

CLASS 411

32 5,813,808
437 5,813,809
510 5,813,810

CLASS 413

16 5,813,811
31 5,813,812

CLASS 414

7 5,813,813
111 5,813,814
137.4 5,813,815
280 5,813,816
5,813,817
407 5,813,818
416 5,813,819
467 5,813,820
667 5,813,821
723 5,813,822
744.5 5,813,823
786 5,813,824
790.5 5,813,825
797 5,813,826

CLASS 415

115 5,813,827
5,813,828
123 5,813,829
170.1 5,813,830
173.6 5,813,831
200 5,813,832
206 5,813,833
5,813,834

CLASS 416

97 R 5,813,835
5,813,836
223 R 5,813,837

CLASS 417

18 5,813,838
61 5,813,839
446 5,813,841
477.1 5,813,842

CLASS 418

55.3 5,813,843
150 5,813,844

CLASS 419

2 5,815,789
5 5,815,790
8 5,815,791
67 5,815,792

CLASS 420

106 5,814,274

CLASS 421

466 5,814,337

CLASS 422

63 5,814,275
65 5,814,276
67 5,814,277
72 5,814,279
82.01 5,814,280
82.11 5,814,565
88 5,814,281
109 5,814,278
135 5,814,282
172 5,814,283
175 5,814,284
177 5,814,285
256 5,814,286

CLASS 423

213.7 5,814,287
244.01 5,814,288
328.2 5,814,289
344 5,814,290
395 5,814,291
549 5,814,292
576 5,814,293

CLASS 424

1.49 5,814,295
1.69 5,814,297
5,814,298
1.73 5,814,299
9.1 5,814,300
9.3 5,814,301
53 5,814,304
57 5,814,303
61 5,814,305
65 5,814,310
69 5,814,311
76.6 5,814,312
78.03 5,814,313
85.1 5,814,307
5,814,308
85.2 5,814,314
93.2 5,814,315
139.1 5,814,316
143.1 5,814,317
184.1 5,814,318
195.1 5,814,319
267.1 5,814,320
278.1 5,814,321
401 5,814,322
5,814,323
405 5,814,324
407 5,814,325
411 5,814,326
414 5,814,327
426 5,814,328
433 5,814,329
434 5,814,330
435 5,814,331
440 5,814,332
442 5,814,333
450 5,814,335
463 5,814,336
472 5,814,338
480 5,814,339
489 5,814,340
493 5,814,341
5,814,342
499 5,814,343
501 5,814,344
535 5,814,345
651 5,814,309
665 5,814,346
677 5,814,347

CLASS 425

4 R 5,814,348
66 5,814,349
67 5,814,350
87 5,814,351
112 5,814,352
149 5,814,353
150 5,814,354
373 5,814,355
556 5,814,356
5,814,357
557 5,814,358

CLASS 426

46 5,814,359
94 5,814,360
231 5,814,362
580 5,814,363

CLASS 427

10 5,814,365
96 5,814,366
162 5,814,367
180 5,814,368
188 5,814,369
213.35 5,814,370
236 5,814,371
245 5,814,372
386 5,814,373
5,814,374
421 5,814,375
428 5,814,376
579 5,814,377

CLASS 428

1 5,814,378
5 5,814,379
9 5,814,380
14 5,814,381
34.3 5,814,382
35.7 5,814,383
5,814,384
35.8 5,814,385
36.3 5,814,386
63 5,814,387
95 5,814,388
132 5,814,389
181 5,814,390
195 5,814,391
209 5,814,392
5,814,393
212 5,814,394
213 5,814,395
5,814,396
216 5,814,397
220 5,814,399
311.51 5,814,405
332 5,814,400
338 5,814,398
343 5,814,401
354 5,814,402
357 5,814,403
364 5,814,404
379 5,814,406
404 5,814,407
408 5,814,408
421 5,814,409
423.1 5,814,410
447 5,814,411
458 5,814,412
516 5,814,413
560 Bl 699,848
586 5,814,414
627 5,814,415
690 5,814,416
5,814,417
694 ML 5,814,418

CLASS 429

104 5,814,420
165 5,814,419
178 5,814,421
187 5,814,422

CLASS 430

5 5,814,423
5,814,424
25 5,814,434
30 5,814,425
96 5,814,426
109 5,814,427
110 5,814,428
124 5,814,429
200 5,814,430
281.1 5,814,431
312 5,814,432
326 5,814,433
393 5,814,435
5,814,436
5,814,437
512 5,814,438
567 5,814,439

CLASS 431

2 5,813,845
8 5,813,847
9 5,813,844
116 5,813,848
202 5,813,849
208 5,813,850

CLASS 432

6 5,813,851

CLASS 433

8 5,813,852
9 5,813,853
29 5,813,854
5,813,855
5,813,856
31 5,813,857
173 5,813,858
223 5,813,859

CLASS 434

169 5,813,861
185 5,813,862
236 5,813,863
253 5,813,864
276 5,813,865
430 5,813,866

CLASS 435

2 5,814,440
5 5,814,441
5,814,442
6 5,814,444
5,814,445
5,814,447
5,814,448
5,814,449
5,814,450
5,814,451
5,814,452
5,814,453
5,814,454
7.1 5,814,455
5,814,456
5,814,457
5,814,458
5,814,459
5,814,460
5,814,461
5,814,462
7.2 5,814,463
7.21 5,814,468
7.23 5,814,469
7.32 5,814,470
7.5 5,814,465
7.8 5,814,466
7.9 5,814,467
8 5,814,471
11 5,814,472
15 5,814,473
34 5,814,474
65.1 5,814,478
69.1 5,814,475
5,814,476
5,814,477
5,814,479
5,814,480
5,814,481
69.3 5,814,482
5,814,486
69.4 5,814,483
69.5 5,814,464
69.51 5,814,485
69.9 5,814,484
74 5,814,487
84 5,814,488
91.2 5,814,489
5,814,490
5,814,491
5,814,492
91.33 5,814,493
118 5,814,494
120 5,814,495
130 5,814,496
5,814,497
136 5,814,498
172.1 5,814,499
172.3 5,814,500
174 5,814,501
188 5,814,502
5,814,503
189 5,814,504
193 5,814,505
194 5,814,506
196 5,814,507
227 5,814,508
233 5,814,509
236 5,814,510
240.2 5,814,511
254.1 5,814,512
261 5,814,513
262 5,814,514
267 5,814,515
287.2 5,814,516
325 5,814,517
372.3 5,814,519
402 5,814,550
419 5,814,520

CLASS 436

74 5,814,521
170 5,814,522
174 5,814,523
518 5,814,524
524 5,814,525

CLASS 437

60 5,814,526

CLASS 438

5 5,814,527
16 5,814,528
30 5,814,529
5,814,530
5,814,531
33 5,814,532
46 5,814,533
5,814,534
5,814,535
5,814,536
151 5,814,537
153 5,814,538
163 5,814,539
166 5,814,540
232 5,814,541
250 5,814,542
264 5,814,543
291 5,814,544
303 5,814,545
309 5,814,546
329 5,814,547
347 5,814,548
398 5,814,549
448 5,814,551
584 5,814,552
595 5,814,553
611 5,814,554
619 5,814,555
620 5,814,556
622 5,814,557
623 5,814,558
648 5,814,560
680 5,814,561
708 5,814,562
714 5,814,563
723 5,814,564

CLASS 439

63 5,813,867
72 5,813,869
82 5,813,868
91 5,813,870
108 5,813,871
125 5,813,872
145 5,813,873
164 5,813,874
319 5,813,923
373 5,813,924
377 5,813,925
430 5,813,926
448 5,813,927
451 5,813,928
480 5,813,929
485 5,813,930
5,813,931
575 5,813,932
594

CLASS 440

1 5,813,886
5 5,813,887
89 5,813,888

CLASS 441

64 5,813,889
79 5,813,890
108 5,813,891

CLASS 442

88 5,814,566
118 5,814,567
123 5,814,568
328 5,814,569
346 5,814,570

CLASS 445

24 5,813,892
25 5,813,893

CLASS 446

95 5,813,894
153 5,813,895
221 5,813,896
250 5,813,897
5,813,898
422 5,813,899

CLASS 451

10 5,813,900
28 5,813,901
65 5,813,902
294 5,813,903

CLASS 452

32 5,813,907
36 5,813,906
133 5,813,904
135 5,813,905
136 5,813,908
138 5,813,909

CLASS 455

3.1 5,815,793
5.1 5,815,794
9 5,815,795
10 5,815,796
13.4 5,815,798
15 5,815,799
31.3 5,815,800
63 5,815,801
67.1 5,815,802
78 5,815,803
5,815,804
5,815,805
410 5,815,807
422 5,815,808
428 5,815,809
433 5,815,810
434 5,815,811
442 5,815,812
446 5,815,813
456 5,815,814
458 5,815,816
509 5,815,817
522 5,815,818
574 5,815,819
575 5,815,820
5,815,821

CLASS 460

113 5,813,910

CLASS 463

19 5,813,911
25 5,813,912
40 5,813,913
46 5,813,914

CLASS 464

68 5,813,915
128 5,813,916
140 5,813,917

CLASS 473

128 5,813,918
290 5,813,919
300 5,813,920
5,813,921
319 5,813,922
373 5,813,923
377 5,813,924
430 5,813,925
448 5,813,926
451 5,813,927
480 5,813,928
485 5,813,929
5,813,930
575 5,813,931
594 5,813,932

CLASS 474

11 5,813,933
84 5,813,934
111 5,813,935

CLASS 475

297 5,813,937
331 5,813,938

CLASS 477

35 5,813,939
93 5,813,940
97 5,813,936
116 5,813,941
120 5,813,942
156 5,813,943
209 5,813,944

CLASS 482

5 5,813,945
27 5,813,946
51 5,813,947
67 5,813,948
70 5,813,949
93 5,813,950
97 5,813,951
111 5,813,952
123 5,813,953
124 5,813,954
5,813,955
129 5,813,956
140 5,813,957
146 5,813,958

CLASS 492

7 5,813,959
18 5,813,960
56 5,813,961
58 5,813,962

CLASS 493

102 5,813,963
302 5,813,964
315 5,813,965
464 5,813,967

CLASS 501

20 5,814,571
32 5,814,572
98.1 5,814,573

CLASS 502

103 5,814,574
117 5,814,575
303 5,814,576
304 5,814,577

CLASS 503

201 5,814,579
227 5,814,580

CLASS 504

140 5,814,581
320 5,814,582

CLASS 505

237 5,814,583
238 5,814,584
782 5,814,585

CLASS 508

221 5,814,586
363 5,814,587

CLASS 510

175 5,814,588
237 5,814,590
238 5,814,591
304 5,814,592
365 5,814,594
411 5,814,595
444 5,814,596
511 5,814,597

CLASS 512

26 5,814,598

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CLASS 514

3	5,814,599
4	5,814,600
6	5,814,601
8	5,814,602
12	5,814,604
	5,814,605
	5,814,607
	5,814,609
17	5,814,603
	5,814,610
19	5,814,611
21	5,814,612
25	5,814,613
	5,814,614
	5,814,615
34	5,814,608
42	5,814,616
44	5,814,617
	5,814,618
	5,814,619
	5,814,620
54	5,814,621
64	5,814,622
155	5,814,623
170	5,814,624
171	5,814,625
220	5,814,628
234.2	5,814,629
234.5	5,814,630
	5,814,631
236.8	5,814,627
237.8	5,814,634
241	5,814,633
249	5,814,635
251	5,814,632
252	5,814,636
255	5,814,638
274	5,814,639
	5,814,640
289	5,814,642
317	5,814,643
323	5,814,644
332	5,814,645
363	5,814,646
369	5,814,647
374	5,814,648
380	5,814,649
387	5,814,650
394	5,814,651
404	5,814,652
411	5,814,653
	5,814,654
413	5,814,655
426	5,814,656
444	5,814,657
449	5,814,658
452	5,814,659
461	5,814,660
470	5,814,661
557	5,814,662
560	5,814,663
579	5,814,664
611	5,814,666
	5,814,667
625	5,814,668
626	5,814,669
635	5,814,670

CLASS 521

31	5,814,671
32	5,814,672
40	5,814,673
49	5,814,674
56	5,814,675
174	5,814,676

CLASS 522

18	5,814,678
31	5,814,679

CLASS 523

106	5,814,680
113	5,814,681
116	5,814,682
161	5,814,683
169	5,814,684
201	5,814,685
205	5,814,686
223	5,814,687

CLASS 524

9	5,814,688
86	5,814,689
100	5,814,690
102	5,814,691
107	5,814,692
188	5,814,693
238	5,814,694
412	5,814,696
495	5,814,697
544	5,814,698
731	5,814,695

CLASS 525

53	5,814,699
54.11	5,814,700
54.44	5,814,701
71	5,814,702
88	5,814,705
103	5,814,703
209	5,814,704
327.6	5,814,706
332	5,814,710
333.3	5,814,707
	5,814,708
	5,814,709
337	5,814,711
431	5,814,712
436	

CLASS 526

210	5,814,713
336	5,814,714
348.6	5,814,715

CLASS 588

256	5,813,968
257	5,813,969

CLASS 600

14	5,813,970
15	5,813,971
17	5,813,972
29	5,813,973
	5,813,974
37	5,813,975
102	5,813,976
183	5,813,977
201	5,813,978
338	5,813,980
372	5,813,981
393	5,813,979
398	5,813,982
407	5,813,983
410	5,813,984
436	5,813,985
440	5,813,986
473	5,813,987
476	5,813,988
484	5,813,989
500	5,813,990
510	5,813,991
528	5,813,992
544	5,813,993
549	5,813,994
585	5,813,996
	5,813,997

CLASS 601

2	5,813,998

CLASS 602

16	5,814,000
24	5,814,001
27	5,814,002
63	5,814,003

CLASS 604

4	5,814,004
8	5,814,005
	5,814,006
21	5,814,008
	5,814,009
22	5,814,010
23	5,814,011
26	5,814,012
35	5,814,013
41	5,814,020
43	5,814,014
96	5,814,016
110	5,814,017
	5,814,018
131	5,814,019
174	5,814,021
191	5,814,022
232	5,814,023
246	5,814,024
266	5,814,025
280	5,814,026
	5,814,028
281	5,814,029
286	5,814,027
294	5,814,030
307	5,814,031
	5,814,032
342	5,814,033
367	5,814,034
385.1	5,814,035
	5,814,036
393	5,814,037
890.1	5,813,999

CLASS 606

1	5,814,038
7	5,814,039
9	5,814,040
15	5,814,041
17	5,814,042
48	5,814,043
	5,814,044
61	5,814,046
62	5,814,047
69	5,814,048
80	5,814,049
102	5,814,050
104	5,814,051
115	5,814,052
139	5,814,054
151	5,814,055
	5,814,056
	5,814,057
185	5,814,058
190	5,814,059
192	5,814,060
194	5,814,061
198	5,814,062
	5,814,063
200	5,814,064
213	5,814,065
214	5,814,066
218	5,814,067
228	5,814,068
	5,814,069
232	5,814,070
	5,814,071
	5,814,072
	5,814,073
234	5,814,074

CLASS 607

1	5,814,078
4	5,814,079
5	5,814,075
	5,814,081
	5,814,082
9	5,814,076
	5,814,077
14	5,814,083
	5,814,085
	5,814,086
21	5,814,087
28	5,814,088
32	5,814,089
36	5,814,090
	5,814,091
46	5,814,092
49	5,814,093
50	5,814,094
57	5,814,095

CLASS 623

2	5,814,096
	5,814,097
	5,814,098
	5,814,099
	5,814,100
	5,814,101
3	5,814,102
6	5,814,103
10	5,814,104
16	5,814,084

CLASS 664

67	5,814,015

CLASS 701

2	5,815,822
19	5,815,823
22	5,815,824
23	5,815,825
50	5,815,826
101	5,815,827
109	5,815,828

CLASS 705

30	5,815,829

CLASS 707

6	5,815,830

CLASS 800

2	5,814,716

CLASSIFICATION OF DESIGNS

D2—	501	398,735
	600	398,736
	605	398,737
	829	398,738
	864	398,739
	887	398,741
	947	398,740
		398,742
		398,743
	954	398,744
		398,745
	955	398,746
	956	398,747
	960	398,748
	962	398,749
	969	398,750
		398,751
		398,752
		398,753
	972	398,754
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		398,760
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		398,762
		398,763
		398,764
		398,765
		398,766
		398,768
		398,770
		398,771
	973	398,769
D3—	203	398,772
	208	398,773
	209	398,774
	211	398,775
	216	398,776
	218	398,777
	303	398,778
D4—	118	398,779
D5—	37	398,780
	63	398,781
D6—	300	398,782
		398,783
	333	398,784
	336	398,785
	354	398,786
	411	398,787
	436	398,788
	464	398,789
	468	398,790
	470	398,792
	501	398,793
	508	398,794
	510	398,795
	512	398,796
	522	398,797
	524	398,798
		398,799
	545	398,800
	556	398,801
	601	398,802
		398,803
		398,804
	608	398,805
	611	398,806
D7—	306	398,807
	354	398,808
	376	398,809
	379	398,810
	391	398,811
	392.1	398,812
	396.2	398,813
	401.2	398,814
	533	398,815
	605	398,816
D8—	8	398,817
		398,818
	14	398,819
		398,820
		398,821
		398,822
	29	398,823
	52	398,824
	57	398,825
		398,826
	71	398,827
	83	398,828
	99	398,829
	333	398,830
	339	398,831
	349	398,832
		398,833
		398,834
	354	398,835
	370	398,836
	397	398,837
D9—	301	398,838
	313	398,839
	336	398,840
	339	398,841
	415	398,842
		398,843
		398,844
	425	398,845
		398,846
		398,847
		398,848
		398,849
	434	398,850
	447	398,851
	453	398,852
	526	398,853
	531	398,854
	537	398,855
	542	398,856
D10—	6	398,857
	15	398,858
	30	398,859
		398,860
		398,861
	31	398,862
	62	398,864
		398,865
	65	398,866
		398,867
		398,868
	71	398,869
	72	398,870
	106	398,871
		398,872
	109	398,873
D11—	25	398,874
	41	398,875
	56	398,876
	63	398,877
	86	398,878
		398,879
	202	398,880
	210	398,881
D12—	88	398,882
	114	398,883
	129	398,884
	137	398,885
	146	398,886
		398,887
		398,888
	147	398,889
		398,890
		398,891
		398,892
	191	398,893
	203	398,895
	208	398,894
	209	398,896
		398,897
	211	398,898
D13—	103	398,899
	123	398,900
		398,901
	135	398,902
D14—	100	398,903
		398,904
		398,905
	102	398,906
		398,907
	107	398,909
		398,910
	113	398,911
	114	398,912
		398,913
		398,914
		398,915
	114.7	398,916
	118	398,917
	124	398,918
	125	398,919
		398,920
	132	398,921
	135	398,922
	137	398,923
	138	398,924
		398,925
		398,926
	149	398,927
	188	398,928
	211	398,929
	250	398,930
		398,931
	257	398,932
D15—	81	398,791
	106	398,908
D16—	326	398,933
D19—	51	398,934
	58	398,935
D21—	2	398,937
	48	398,938
	61	398,936
	86	398,939
	104	398,940
		398,941
		398,942
	109	398,943
	131	398,944
	185	398,945
	214	398,946
	217	398,947
	764	398,948
D22—	108	398,949
D23—	200	398,950
	202	398,951
	216	398,952
	223	398,953
	226	398,954
	235	398,955
	238	398,956
		398,957
	241	398,958
	249	398,959
		398,960
	250	398,961
	252	398,962
	255	398,963
		398,964
	259	398,965
	277	398,966
	280	398,969
	284	398,967
	285	398,968
	290	398,970
	293.1	398,971
	295	398,972
	302	398,973
	351	398,974
	355	398,975
	367	398,976
	370	398,977
		398,978
	372	398,979
	377	398,980
		398,981
	380	398,982
	382	398,983
	411	398,984
	499	398,997
D24—	108	398,985
	110.4	398,987
	112	398,986
	113	398,988
	115	398,989
	118	398,990
		398,991
	119	398,992
	122	398,993
	124	398,994
	133	398,995
	140	398,996
	143	398,998
	165	398,999
	167	399,000

	174	399,001
	180	399,002
	190	399,003
	193	399,004
	197	399,005
		399,006
	227	399,007
	232	399,008
D25—	38	399,009
	123	399,010
		399,012
	133	399,013
	163	399,011
D26—	26	399,014
	28	399,015
	42	399,016
	45	399,017
	63	399,018
	77	399,019
	90	399,020
	106	399,021
	142	399,022
	152	399,023
D27—	102	399,024
	134	399,025
D28—	13	399,026
	53	399,027
D29—	129	399,028
D30—	130	399,029
D32—	21	399,030
D34—	24	399,031
	25	399,032
	39	399,033
D99—	31	399,034

CLASSIFICATION OF PLANTS

P.—	1	10,616
		10,617
		10,618
	11	10,619
		10,620
	13	10,621
	17	10,622
	34.1	10,623
	68.1	10,624
	69.2	10,625
	87.4	10,626
	88.1	10,627

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PATENTS

01 :	5,813,354	5,813,262	5,813,912	5,814,318	5,814,734	5,815,146
	5,813,568	5,813,298	5,813,913	5,814,325	5,814,737	5,815,149
	5,814,344	5,813,328	5,813,919	5,814,328	5,814,738	5,815,157
	5,815,187	5,813,343	5,813,921	5,814,367	5,814,742	5,815,159
02 :	5,813,126	5,813,357	5,813,922	5,814,377	5,814,744	5,815,164
	5,815,064	5,813,382	5,813,925	5,814,381	5,814,745	5,815,167
04 :	5,813,071	5,813,399	5,813,932	5,814,388	5,814,747	5,815,168
	5,813,088	5,813,406	5,813,944	5,814,397	5,814,750	5,815,185
	5,813,094	5,813,408	5,813,946	5,814,420	5,814,752	5,815,189
	5,813,217	5,813,411	5,813,956	5,814,440	5,814,761	5,815,202
	5,813,225	5,813,416	5,813,980	5,814,441	5,814,796	5,815,206
	5,813,625	5,813,417	5,813,991	5,814,451	5,814,809	5,815,212
	5,813,634	5,813,418	5,813,997	5,814,454	5,814,847	5,815,229
	5,813,649	5,813,425	5,813,998	5,814,455	5,814,853	5,815,257
	5,813,809	5,813,430	5,814,016	5,814,458	5,814,854	5,815,261
	5,813,876	5,813,433	5,814,018	5,814,459	5,814,856	5,815,266
	5,813,897	5,813,461	5,814,021	5,814,467	5,814,858	5,815,270
	5,813,898	5,813,467	5,814,022	5,814,470	5,814,862	5,815,277
	5,814,545	5,813,495	5,814,024	5,814,480	5,814,864	5,815,285
	5,814,561	5,813,497	5,814,038	5,814,481	5,814,881	5,815,302
	5,814,727	5,813,530	5,814,039	5,814,482	5,814,884	5,815,303
	5,815,017	5,813,577	5,814,040	5,814,484	5,814,892	5,815,306
	5,815,020	5,813,606	5,814,049	5,814,485	5,814,914	5,815,307
	5,815,370	5,813,630	5,814,058	5,814,489	5,814,979	5,815,327
	5,815,372	5,813,633	5,814,059	5,814,495	5,814,983	5,815,337
	5,815,417	5,813,640	5,814,060	5,814,501	5,814,989	5,815,345
	5,815,445	5,813,656	5,814,062	5,814,507	5,814,995	5,815,346
	5,815,523	5,813,673	5,814,075	5,814,517	5,815,003	5,815,347
	5,815,524	5,813,678	5,814,077	5,814,523	5,815,004	5,815,349
	5,815,545	5,813,683	5,814,082	5,814,530	5,815,013	5,815,350
	5,815,577	5,813,685	5,814,096	5,814,536	5,815,015	5,815,360
	5,815,656	5,813,695	5,814,097	5,814,544	5,815,016	5,815,380
	5,815,675	5,813,721	5,814,099	5,814,560	5,815,024	5,815,383
	5,815,715	5,813,734	5,814,100	5,814,563	5,815,028	5,815,384
05 :	5,813,259	5,813,742	5,814,135	5,814,591	5,815,040	5,815,391
	5,813,872	5,813,744	5,814,154	5,814,600	5,815,043	5,815,403
06 :	5,813,055	5,813,754	5,814,160	5,814,601	5,815,046	5,815,404
	5,813,056	5,813,826	5,814,174	5,814,603	5,815,047	5,815,405
	5,813,063	5,813,828	5,814,176	5,814,605	5,815,071	5,815,410
	5,813,073	5,813,839	5,814,195	5,814,607	5,815,093	5,815,411
	5,813,078	5,813,861	5,814,196	5,814,609	5,815,097	5,815,416
	5,813,109	5,813,862	5,814,222	5,814,618	5,815,113	5,815,421
	5,813,146	5,813,873	5,814,225	5,814,619	5,815,114	5,815,422
	5,813,157	5,813,881	5,814,227	5,814,655	5,815,116	5,815,425
	5,813,176	5,813,889	5,814,228	5,814,657	5,815,117	5,815,426
	5,813,181	5,813,890	5,814,242	5,814,700	5,815,118	5,815,431
	5,813,182	5,813,892	5,814,259	5,814,705	5,815,124	5,815,434
	5,813,188	5,813,910	5,814,265	5,814,724	5,815,137	5,815,435
	5,813,218	5,813,911	5,814,308	5,814,729	5,815,143	5,815,438

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5,813,300
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DESIGN PATENTS

01	:	398,895	12	:	398,741			399,031			399,014			398,970			398,878
05	:	398,945			398,751	25	:	398,740			399,034			398,985			398,884
06	:	398,737			398,810			398,749	36	:	398,735	40	:	398,805			398,915
		398,747			398,812			398,750			398,782			398,993	44	:	398,857
		398,772			398,923			398,752			398,786			399,007	45	:	398,791
		398,777			398,932			398,780			398,789			399,025			398,802
		398,784			398,947			398,806			398,798	41	:	398,742			398,862
		398,804			398,989			398,902			398,799			398,743			398,892
		398,822	13	:	398,949			398,912			398,809			398,744	47	:	398,939
		398,824			398,981			398,982			398,813			398,745			398,980
		398,827			398,986			398,994			398,821			398,746			398,992
		398,834			398,998			398,996			398,839			398,748			399,032
		398,837	17	:	398,800	26	:	398,774			398,853			398,754	48	:	398,738
		398,894			398,818			398,790			398,873			398,755			398,776
		398,906			398,845			398,841			398,880			398,756			398,797
		398,907			398,846			398,844			398,933			398,757			398,831
		398,914			398,847			398,856			398,936			398,758			398,867
		398,918			398,848			398,944			398,940			398,759			398,868
		398,925			398,851			398,953			398,941			398,760			398,869
		398,930			398,870			399,009			398,942			398,761			398,893
		398,931			398,916			399,018			398,968			398,762			399,003
		398,957			398,926			399,022			399,005			398,763	51	:	398,820
		398,964			398,943	27	:	398,779			399,016			398,764	53	:	398,903
		398,995			398,979			398,877	37	:	398,739			398,765			399,017
		399,013			399,024			398,988			398,788			398,766	55	:	398,781
		399,029			399,028	29	:	398,785			398,984			398,768			398,794
		399,030	18	:	398,959			398,787	39	:	398,775			398,769			398,852
08	:	398,976			398,960	30	:	398,832			398,778			398,770			398,883
09	:	398,753			399,015	33	:	398,987			398,816			398,771			398,961
		398,783	20	:	398,972	34	:	398,736			398,854			398,921			398,962
		398,836			398,973			398,817			398,885			398,937			398,966
		398,849			398,983			398,835			398,886			398,948			398,967
		398,859	21	:	398,808			398,881			398,887	42	:	398,803			398,969
		398,861			399,008			398,950			398,889			398,830			398,971
		398,866	22	:	398,879			399,010			398,891			398,864			399,004
		398,899	24	:	399,000			399,012			398,963			398,865			

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06	:	10,616	41	:	10,626												

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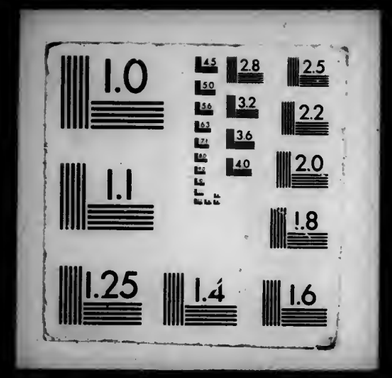

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